FURUNO

INSTALLATION MANUAL

UAIS TRANSPONDER

MODEL FA-150

FURUNO ELECTRIC CO., LTD.
NISHINOMIYA, JAPAN

PRINTED IN JAPAN

ECF
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IME44310C10

SAFETY INSTRUCTIONS

WARNING

ELECTRICAL SHOCK HAZARD
Do not open the equipment unless totally familiar with electrical circuits and service manual.

Only qualified personnel should work inside the equipment.

Turn off the power at the switchboard before beginning the installation.

Fire or electrical shock can result if the power is left on.

Do not install the equipment where it may get wet from rain or water splash.

Water in the equipment can result in fire, electrical shock or damage the equipment.

Be sure that the power supply is compatible with the voltage rating of the equipment.

Connection of an incorrect power supply can cause fire or damage the equipment. The voltage rating of the equipment appears on the label above the power connector.

CAUTION

Observe the following compass safe distances to prevent interference to a magnetic compass:

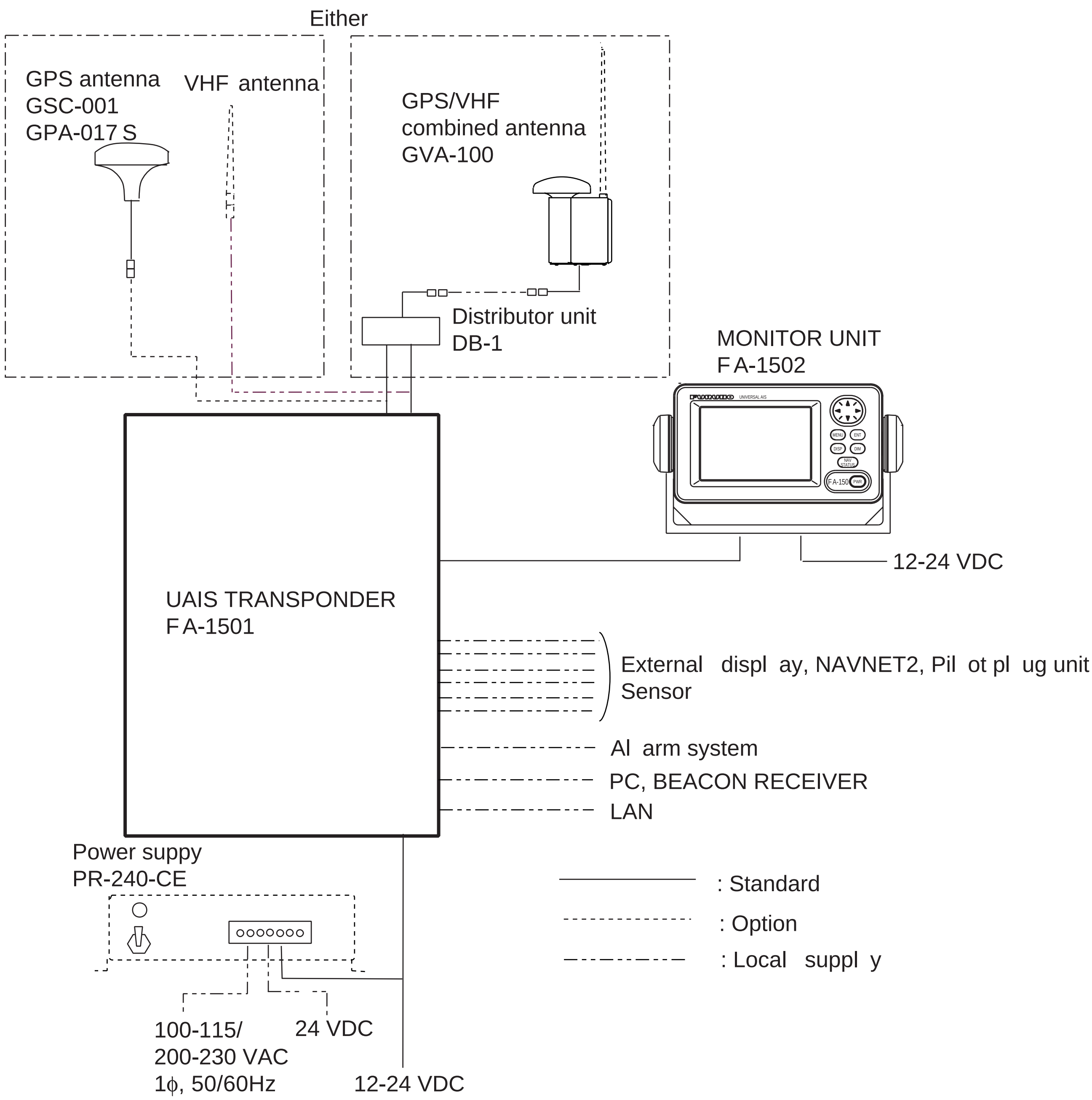
	Standard compass	Steering compass
FA-1501 UAIS Transponder	1.2 m	0.8 m
FA-1502 Monitor unit	0.45 m	0.3 m
GVA-100	0.3 m	0.3 m
DB-1	0.3 m	0.3 m
PR-240-CE	0.9m	0.6 m

Attach securely protective earth to the ship's body.

The protective earth is required to the power supply to prevent electrical shock.

TABLE OF CONTENTS

SYSTEM CONFIGURATION



Category of the units

GSC-001	Exposed to the weather
GPA-017S	Exposed to the weather
GVA-100	Exposed to the weather
FA-1501	Protected from the weather
FA-1502	Protected from the weather
DB-1	Protected from the weather
PR-240-CE	Protected from the weather

EQUIPMENT LISTS

Standard supply

No.	Name	Type	Code no.	Qty	Remarks
1	UAIS Transponder	FA-1501	-	1	
2	Monitor Unit	FA-1502	-	1	
3	GPS Antenna	GSC-001	-	1	Select one.
		GPA-017S	-		
	GPS/VHF Combined Antenna	GVA-100	-		
4	Installation Materials	MJ-A10SPF0012-050	000-150-216	1	Cable for FA-1501
		CP24-00501	005-955-550		For FA-1501
		CP24-00400	000-041-980	1	For FA-1502 CP14-06001 & Cable MJ-A3SPF0013-035
		CP24-00101	005-950-730	1	For DB-1
		CP24-00141	005-952-330	1	For GVA-100
		CP24-00502	005-955-560	1	For GPA-017S/GSC-001
5	Accessories	FP14-02801	004-366-960	1	For FA-1502
6	Spare Parts	SP24-00101	-	1	For FA-1502

Optional supply

No.	Name	Type	Code no.	Remarks	
1	Monitor unit	FA-1502	-		
2	Antenna cable set	CP20-02700	004-381-160	8D-FB-CV(30m)+CP20-02701	
		CP20-02710	004-381-170	8D-FB-CV(50m)+CP20-02701	
3	Antenna cable set	CP24-00300	000-041-938	8D-FB-CV(30m)+CP24-00301	
		CP24-00310	000-041-939	8D-FB-CV(50m)+CP24-00301	
4	Coaxial cable	TNC-PS-3D-15	000-133-670	TNC-TNC, 15m	
5	Mast mount fixture	CP20-01111	004-365-780	For GSC-001	
6	Right-angle antenna base	No.13-QA330	000-803-239	For GSC-001	
7	L-angle antenna base	No.13-QA310	000-803-240	For GSC-001	
8	Antenna base for rail mount	No.13-RC5160	000-806-114	For GSC-001	
9	Whip antenna	FAB-151D	000-572-029	For Japan only	
10	Antenna fixing bracket	4-310071	000-572-184	For FAB-151D	
11	Whip antenna	150M-W2VN	000-113-498	For outside Japan	
12	AC-DC power supply	PR-240-CE	-	Include installation materials CP24-00151*	
13	Pilot plug	OP24-3	000-053-911		
14	AD-100	AD-100	-	For gyrocompass	
15	Cable assy.	MJ-A10SPF 0012-050	000-150-216	5m	Transponder-display, connector attached at one end
		MJ-A10SPF 0012-100	000-150-217	10m	
		MJ-A10SPF 0012-250	000-150-218	25m	
		MJ-A10SPF 0012-500	000-150-219	50m	
		MJ-A10SPF 0012-1000	000-150-220	100m	
16	Flush mount kit S	OP20-17	000-040-720	For monitor unit	
	Flush mount kit F	OP20-29	000-041-405		
17	ϕ 80 Mast mount kit	OP24-5	005-954-510	For GVA-100	
18	GPS antenna	GSC-001-FA-T	-		
19	LAN kit	OP24-8	005-956-020	See page 25.	

1. MOUNTING

1.1 Antenna Units

1.1.1 GPS antenna unit

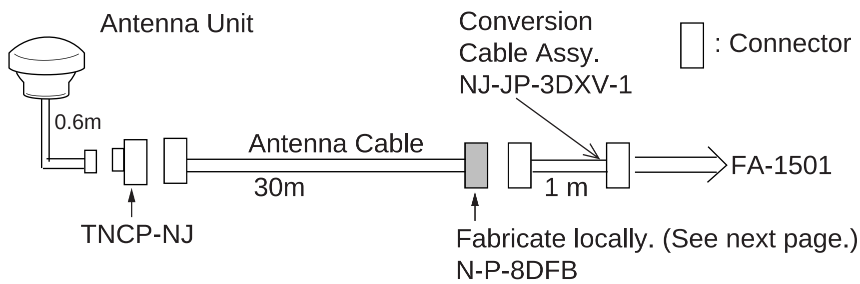
Install the GPS antenna unit referring to the drawing on page D-1 at the back of this manual. When selecting a mounting location for the antenna, keep in mind the following points.

- Select a location out of the radar beam. The radar beam will obstruct or prevent reception of the GPS satellite signal.
- There should be no interfering object within the line-of-sight to the satellites. Objects within line-of-sight to a satellite, for example, a mast, may block reception or prolong acquisition time.
- Mount the antenna unit as high as possible to keep it free of interfering objects and water spray, which can interrupt reception of GPS satellite signal if the water freezes.

Extending antenna cable

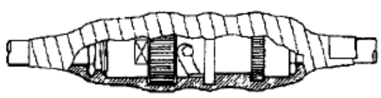
Three types of antenna cable extensions are optionally available.

a) Antenna cable set CP20-02700



◆ Waterproofing connector

Wrap connector with vulcanizing tape and then vinyl tape. Bind the tape end with a cable-tie.



Waterproofing connector

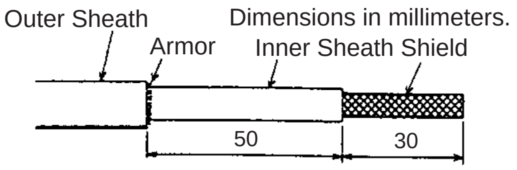
b) Antenna cable set CP20-02710 (8D-FB-CV, 50m)

Connect the cable the same as a) above.

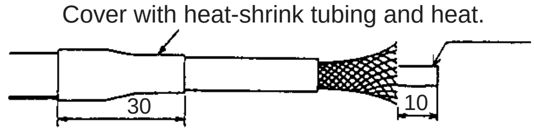
c) Cable type RG-10/UY (shipyard supply)

Note: The length of this cable should be less than 20 m to prevent signal loss. The coax. coupling cable assy.(type: NJ-TP+3DXV-1, code no. 000-123-809), coaxial connector(N-P-8DFB; supplied), vulcanizing tape and vinyl tape are required. Fabricate both ends of the cable as shown in the figure on the next page.

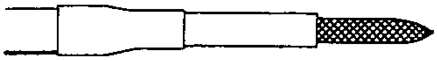
How to attach the connector N-P-8DFB for cable 8D-FB-CV



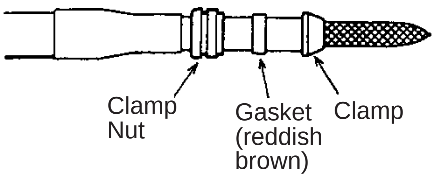
Remove outer sheath and armor by the dimensions shown left.
Expose inner sheath and shield by the dimensions shown left.



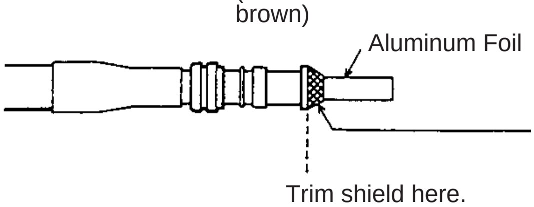
Cut off insulator and core by 10mm.



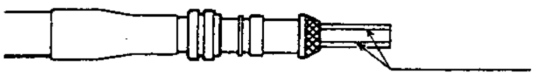
Twist shield end.



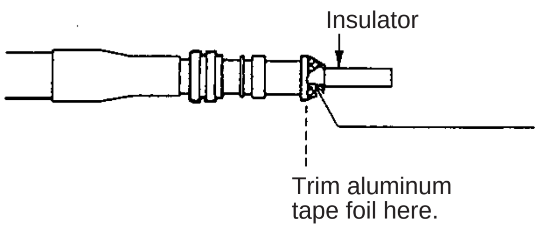
Slip on clamp nut, gasket and clamp as shown left.



Fold back shield over clamp and trim.



Cut aluminum foil at four places, 90° from one another.

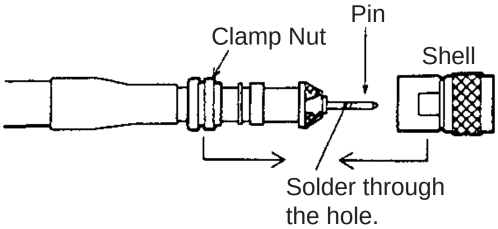


Fold back aluminum foil onto shield and trim.



Expose the insulator by 1mm.

Expose the core by 5mm.



Slip the pin onto the conductor. Solder them together through the hole on the pin.

Insert the pin into the shell. Screw the clamp nut into the shell.
(Tighten by turning the clamp nut. Do not tighten by turning the shell.)

How to attach connector N-P-8DFB

1.1.2 VHF antenna

Location

The location of the mandatory AIS VHF-antenna should be carefully considered. Digital communication is more sensitive than analog/voice communication to interference created by reflections in obstructions like masts and booms. It may be necessary to relocate the VHF radiotelephone antenna to minimize interference effects.

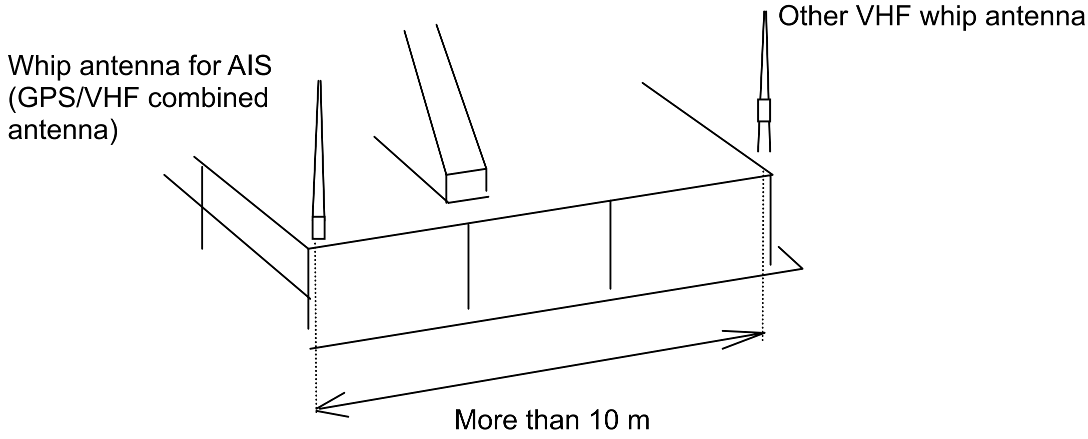
To minimise interference effects, the following guidelines apply:

- The AIS VHF antenna should be placed in an elevated position that is as free as possible with a minimum of 0.5 meters in the horizontal direction from constructions made of conductive materials. The antenna should not be installed close to any large vertical obstruction. The objective for the AIS VHF antenna is to see the horizon freely through 360 degrees.
- The AIS VHF antenna should be installed safely away from interfering high-power energy sources like radar and other transmitting radio antennas, preferably at least 3 meters away from and out of the transmitting beam.
- There should not be more than one antenna on the same plane. The AIS VHF antenna should be mounted directly above or below the ship’s primary VHF radiotelephone antenna, with no horizontal separation and with a minimum of 2.8 meters vertical separation. If it is located on the same plane as other antennas, the distance apart should be at least 10 meters.

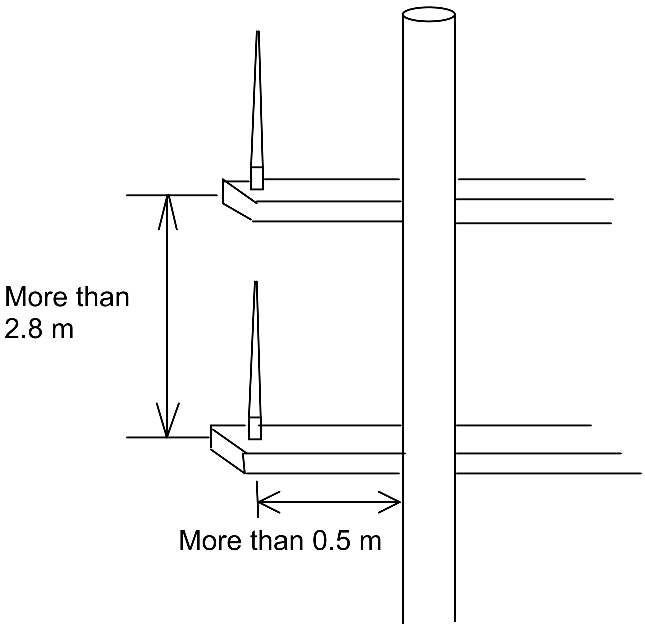
Cabling

- The cable should be kept as short as possible to minimize signal attenuation. Coaxial cables equal to or better than RG10U/Y are recommended.
- All outdoor-installed connectors on coaxial cables should be fitted with preventive isolation such as vulcanizing tape to protect against water penetration into the antenna cable.
- Coaxial cables should be installed in separate signal cable channels/tubes and at least 10 cm away from power supply cables. Crossing of cables should be done at right angles (90°). The minimum bend radius of the coaxial cable should be 5 times the cable's outer diameter.
- Install the VHF whip antenna referring to the outline drawing at the back of this manual. Separate this antenna from other VHF radiotelephone antennas as shown on the next page to prevent interference to the FA-150.

Horizontal separation distance



Vertical separation distance

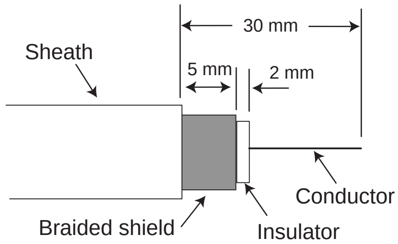


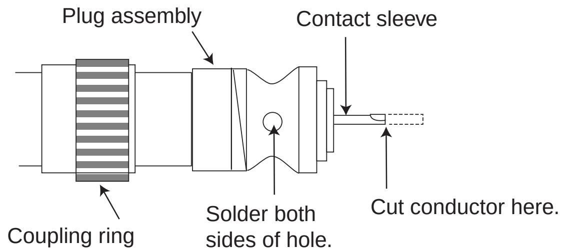
- When coaxial cable RG-10U/Y (shipyard supply) is used, attach the coaxial plug M-P-7 (dockyard supply) as shown on the next page.

How to attach the plug M-P-7

Lay the coaxial cable and attach an M-type plug (if necessary) to the cable as follows.

1. Remove the sheath by 30 mm.
2. Bare 23 mm of the center conductor. Trim braided shield by 5 mm and tin.
3. Slide coupling ring onto cable.
4. Screw the plug assembly on the cable.
5. Solder plug assembly to braided shield through solder holes. Solder contact sleeve to conductor.
6. Screw coupling ring into plug assembly.

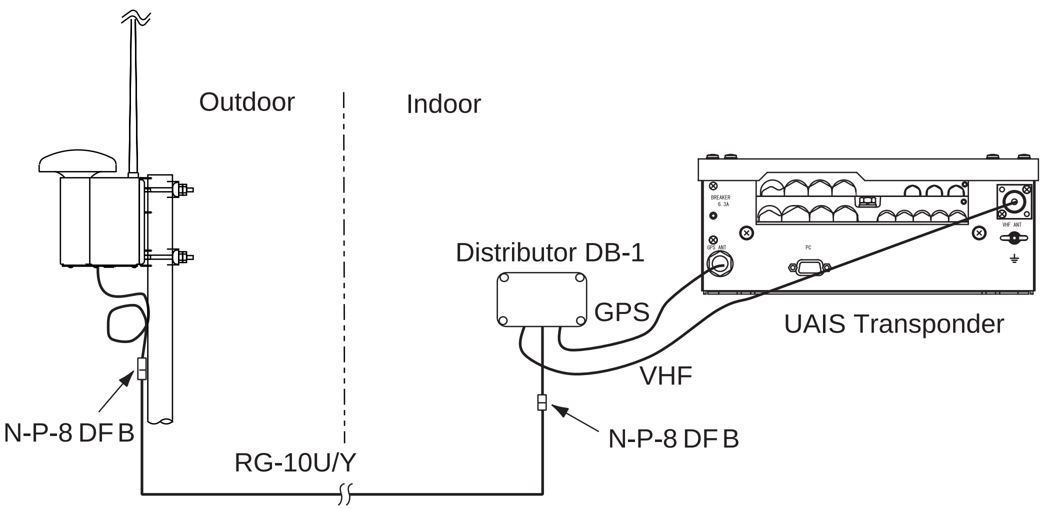




1.1.3 GPS/VHF combined antenna

Install the combined antenna unit referring to the outline drawing. When selecting a mounting location for the antenna, keep in mind the following points.

- Select a location out of the radar beam. The radar beam will obstruct or prevent reception of the GPS satellite signal.
- There should be no interfering object within the line-of-sight to the satellites. Objects within line-of-sight to a satellite, for example, a mast, may block reception or prolong acquisition time.
- Mount the antenna unit as high as possible. Mounting it this way keeps it free of interfering objects and water spray, which can interrupt reception of GPS satellite signal if the water freezes.
- Also, refer to the antenna installation guidelines page 3.

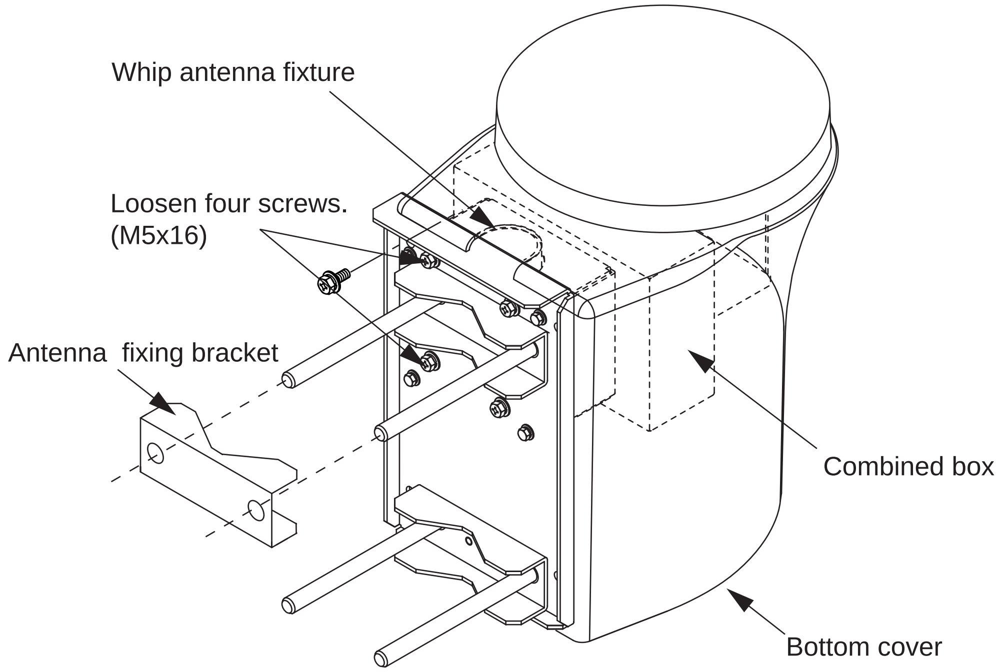


Installation overview of GPS/VHF combined antenna

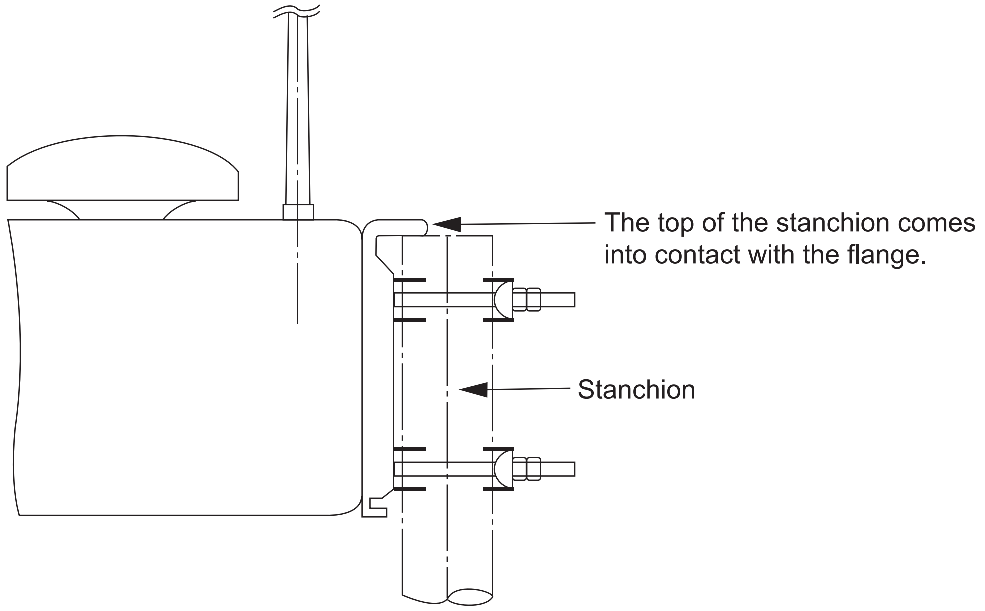
Mounting procedure

1. Dismount the bottom cover, cut the cable-tie inside the unit and take out the coaxial connector attached to the combined box.
2. Loosen four screws to loosen whip antenna fixture and pull out the coaxial connector coming from the combined box through the hole in the whip antenna fixture.
3. Connect the coaxial connector to the whip antenna base and wrap the junction part of the whip antenna with vulcanizing tape and then vinyl tape for waterproofing.
4. Insert the whip antenna from the top of the combined antenna.
5. Secure the whip antenna with whip antenna fixture.
6. Using a new plastic band (supplied), secure the cables and coaxial connector inside the antenna case.
7. Mount the bottom cover.
8. Fix the GPS/VHF combined antenna to the ship's stanchion (40 to 50 mm diameter) with antenna fixing brackets, flat washers and hex. nuts.

Note: Coat the exposed parts of bolts and nuts with silicon sealant.

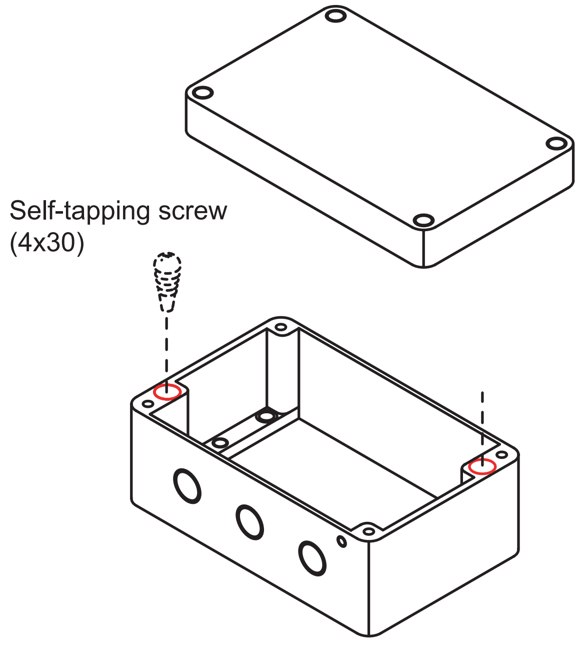


GPS/VHF Combined antenna



Installing distributor unit DB-1

The length of the cable between the distributor unit and transponder unit is 1 m so locate the distributor unit within 1 m from the transponder unit. Fix the distributor unit on the bulkhead, facing the cable entrance downward. Remove the lid of the distributor unit and secure the unit with two self-tapping screws.



Note: Be sure no foreign material or water enters the distributor unit.

1.2 Monitor Unit

The monitor unit can be installed on a desktop or flush mounted in a panel. Install it on the chart table or near the steering place, referring to the outline drawing.

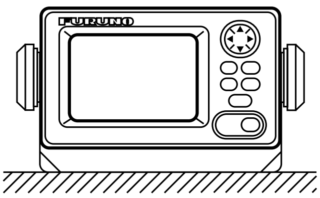
When selecting a mounting location for the monitor unit, keep the following in mind:

- Keep the unit out of direct sunlight.
- The temperature and humidity should be moderate and stable.
  (Operating temperature range: -15°C to +55°C)
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- Keep the unit away from electromagnetic field generating equipment such as motor, generator.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables. Refer to the outline drawing.
- A magnetic compass will be affected if the unit is placed too close to it. Observe the following compass safe distances to prevent disturbance to the magnetic compass:

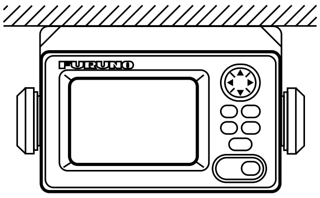
  Standard compass: 0.45 meters
  Steering compass: 0.3 meters

Desktop mounting

1. Fasten the hanger with four self-tapping screws (5x20).
2. Fasten the monitor unit to the hanger with two knobs.



Tabletop



Overhead

Flush mounting

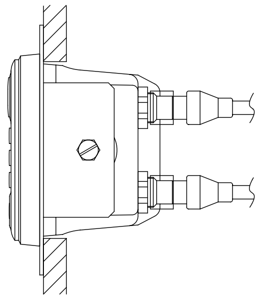
There are two types of flush mount kits, F type and S type. For details, see the outline diagrams at the back of this manual.

F type

Use the optional flush mount kit OP20-29.

Name	Type	Code No.	Qty
Cosmetic panel	20-016-1051	100-251-370	1
Self-tapping screw	5X20	000-802-840	4
Hexagon-head bolt	M6X12	000-862-127	2
Spring washer	M6	000-864-260	2

1. Prepare a cutout in the mounting location whose dimensions are 183 (W) X 92 (H) mm.
2. Attach the cosmetic panel (20-016-1051) to the unit with two hex head bolts (M6X12) and two spring washers (M6).
3. Fix the unit to the mounting location with four self-tapping screws (5X20).

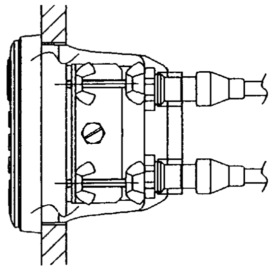


S type

Use the optional flush mount kit OP20-17.

.Name	Type	Code No.	Qty
Fixing plate	20-007-2401	100-183-190	2
Hexagon-head bolt	M6X12	000-862-127	2
Wing bolt	M4X30	000-804-799	4
Wing nut	M4	000-863-306	4
Spring washer	M6	000-864-260	2

1. Prepare a cutout in the mounting location whose dimensions are 167 (W) X 92 (H) mm.
2. Insert the unit to the cutout.
3. Attach two fixing plates (20-007-2401) to the unit with two hex bolts (M6X12) and two spring washers (M6).
4. Screw four wing bolts (M4X30) to wing nuts (M4).
5. Fasten the unit with four wing bolts and nuts.



1.3 UAIS Transponder

Mount the transponder, where it is protected from rain and water splash.
This unit can be installed on a bulkhead. Install it, referring to the outline drawing.

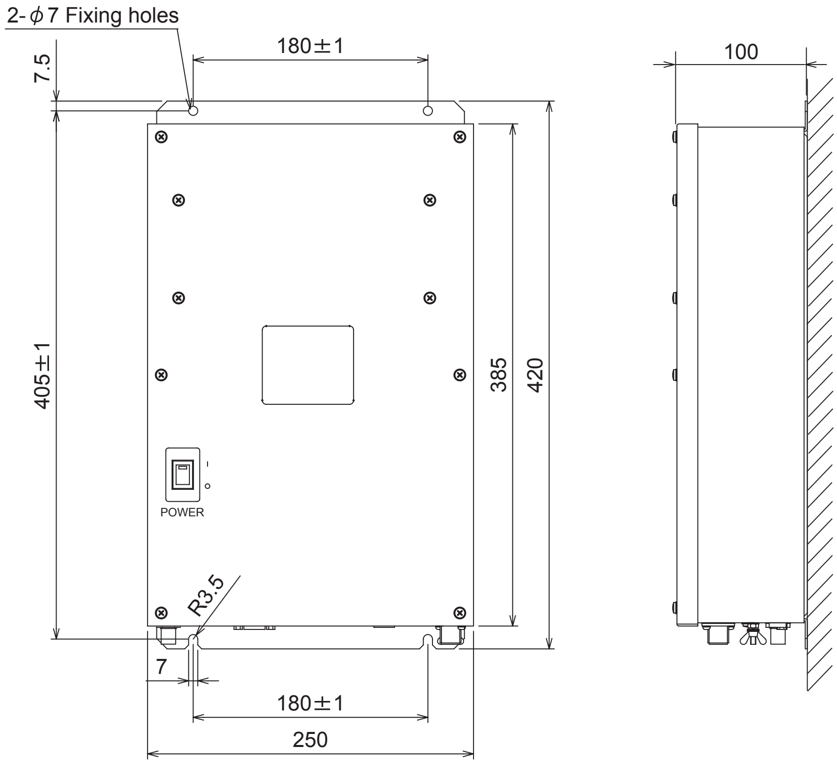
When selecting a mounting location for the transponder, keep the following in mind:

- Keep the transponder out of direct sunlight.
- The temperature and humidity should be moderate and stable. (Operating temperature range: -15°C to +55°C)
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- Keep the unit away from electromagnetic field generating equipment such as motor, generator.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables. Refer to the outline drawing.
- A magnetic compass will be affected if the unit is placed too close to it. Observe the following compass safe distances to prevent disturbance to the magnetic compass:

  Standard compass: 1.2 meters
  Steering compass: 0.8 meters

Mounting

- Fix the unit with four self-tapping screws.

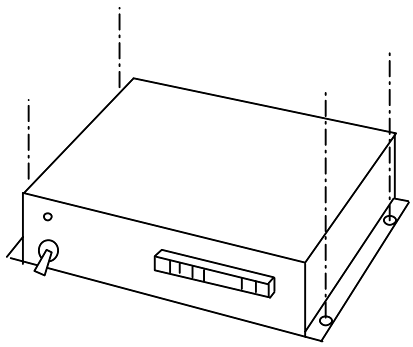


1.4 Power Supply (option)

When selecting a mounting location for the unit, keep the following in mind:

- Keep the unit out away from areas subject to water splash.
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- A magnetic compass will be affected if the unit is placed too close to it. Observe the following compass safe distances to prevent disturbance to the magnetic compass:
  Steering compass: 0.6 m
  Standard compass: 0.9 m

Fix the unit with four self-tapping screws (4x16) to a desktop or the deck as shown in the figure below. It is not necessary to open the cover.



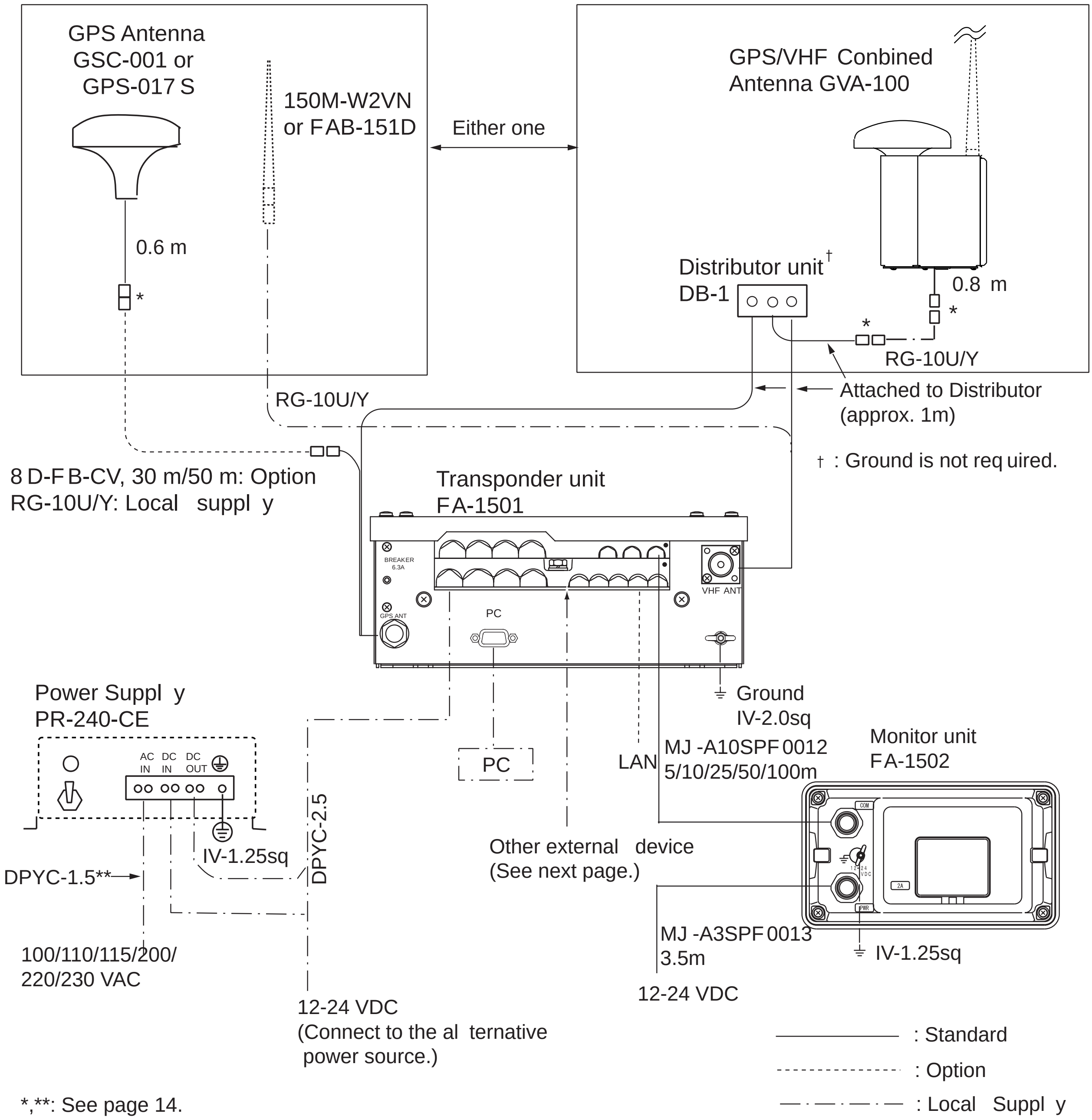
1.5 Pilot Plug (option)

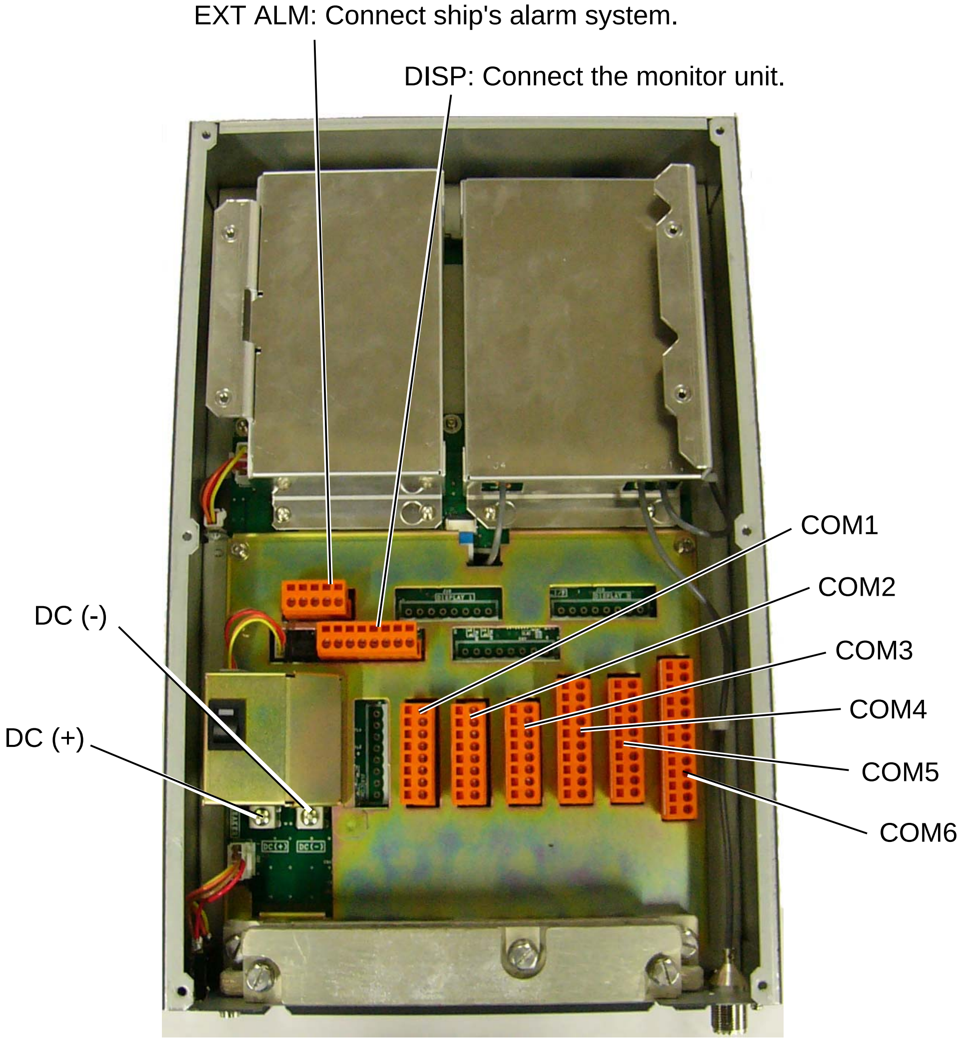
The pilot plug should be mounted near where the pilot steers the ship. This plug is used to connect a PC to display AIS information for use by the pilot. Refer to the outline drawing at the back of this manual for mounting dimensions.

2. WIRING

2.1 Connection

Connect the equipment, referring to the interconnection diagram at the back this manual.





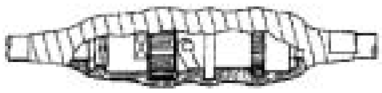
Internal ports of the Transponder

COM1: Long range communication device (Inmarsat C, etc.) or
External display (Radar, ECDIS, Pilot plug)
COM2 & COM3: External display, NAVNET 2, Pilot plug
COM4-COM6: GPS, Gyrocompass, Speedlog, ROT, etc.

Note: A plastic sheet is placed across the cable glands of the transponder to keep out foreign material. Cut out holes in the plastic where cables are to be lead in.

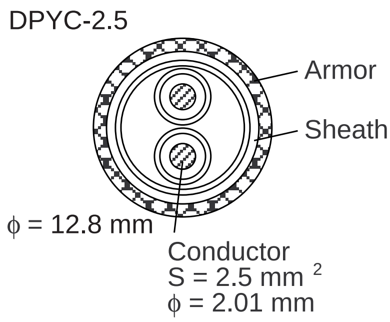
*: Waterproofing connectors

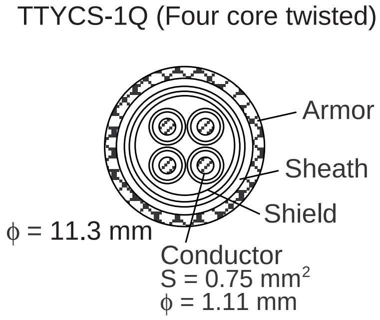
Wrap connector with vulcanizing tape and then vinyl tape. Bind the tape end with a cable-tie.

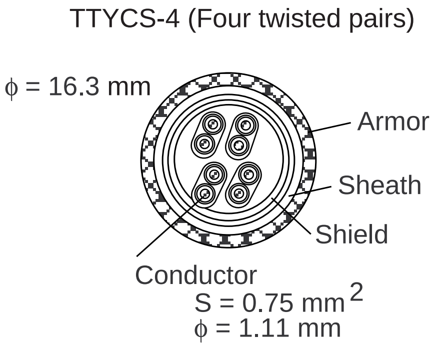


Waterproofing connector

**: DPYC-2.5, TTYCS-1Q and TTYCS-4 are Japan Industry Standard cables. Use them or the equivalents.

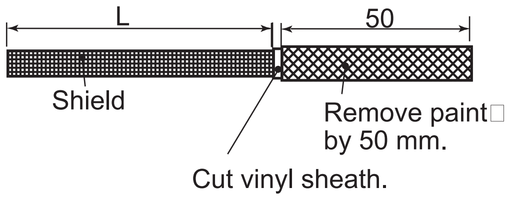




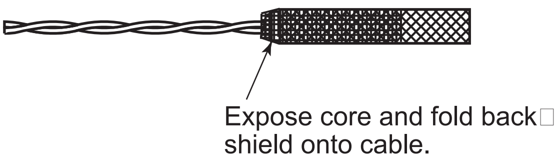


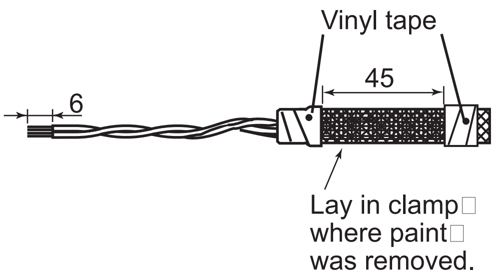
Cable connection at transponder

Fabrication of cables TTYCS-4 and TTYCS-1Q



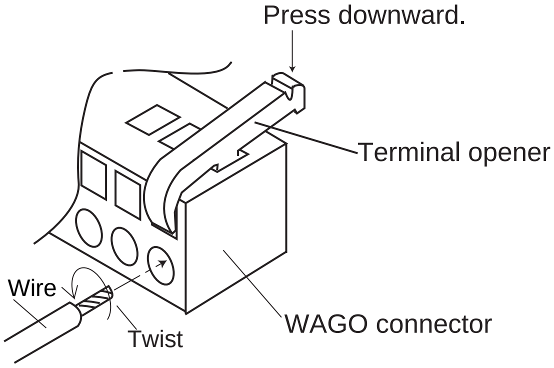
L: Depends on equipment connected.
Measure at the transponder.





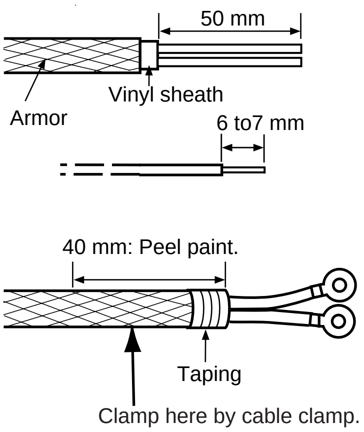
Connection

Wiring for WAGO connector



Procedures
1. Twist the cores.
2. Press the terminal opener downward.
3. Insert the wire to hole.
4. Remove the terminal opener.
5. Pull the wire to confirm that it is secure.

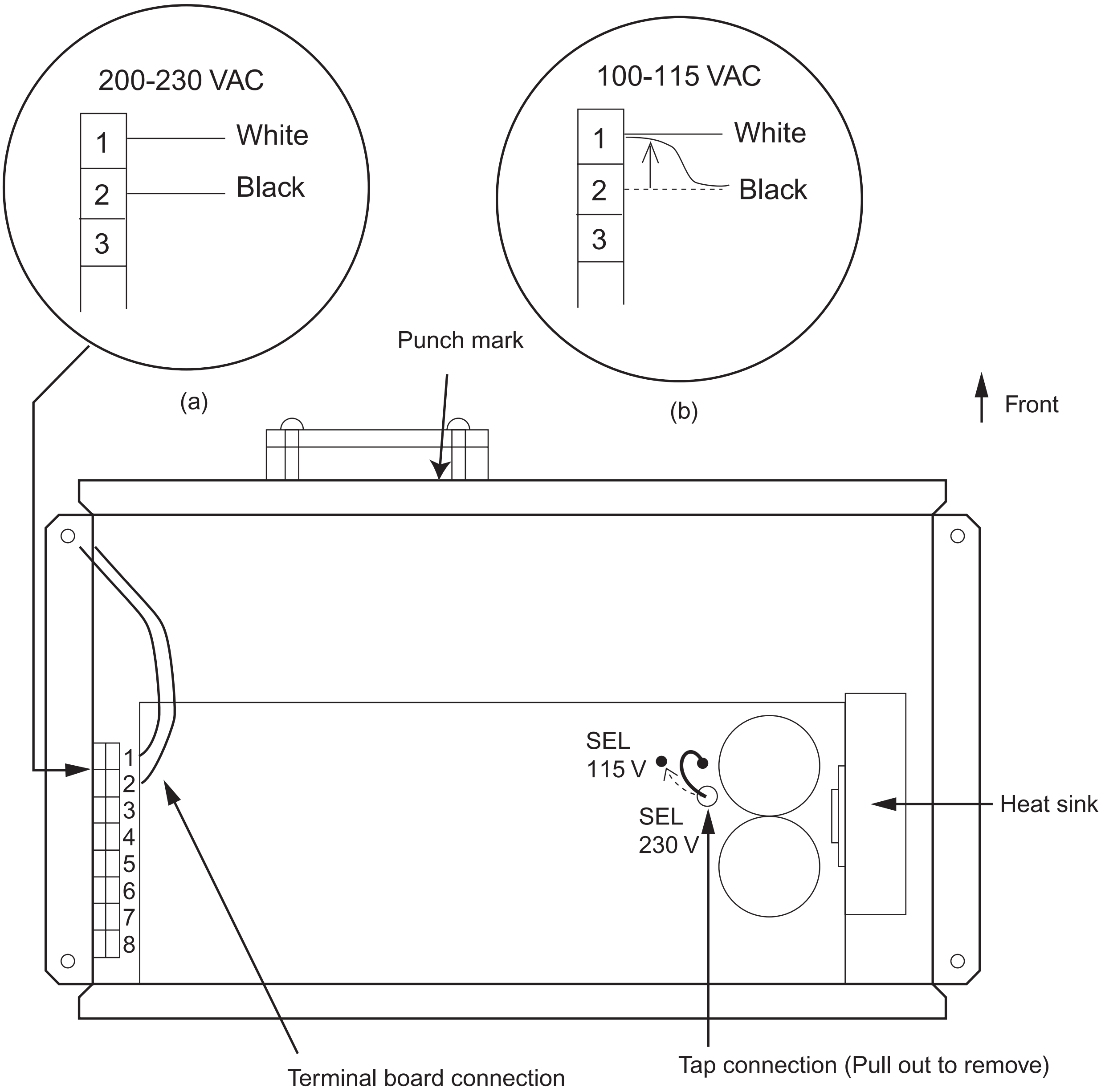
Fabrication of power cable DPYC-2.5



2.2 Changing Ship's Mains Specifications

The power supply PR-240-CE is shipped ready for connection to a 200-230 VAC ship's mains. If the ship's mains is 100 VAC – 115 VAC, change the tap connection and terminal board connection as below. Attach label supplied as accessories to the punch mark on the front panel according to the ship's mains.

Ship's mains	Tap connection	Terminal board connection #1 & #2
100-115 VAC	SEL 115 V	b
200-230 VAC	SEL 230 V	a



Top view (Cover removed)

3. SETTING AND ADJUSTMENT

After installing the equipment, set up the own ship’s static information (MMSI, IMO number, ship’s name, call sign, type of ship and GPS antenna position). Also, set up the I/O ports.

3.1 Setting MMSI, IMO No., Name and Call Sign

1. Press the [MENU] key to open the main menu.

```
[MENU]
MSG
SENSOR STATUS
INTERNAL GPS
USER SETTINGS
INITIAL SETTINGS
CHANNEL SETTINGS
DIAGNOSTICS
```

2. Press ▼ on the cursor pad to choose INITIAL SETTINGS and press the [ENT] key. The following password entry window appears.

```
[ENTER PASSWORD]
--------------
```

Password entry window

3. Enter the password. The INITIAL SETTINGS window appears. Note that the password is known by only the FURUNO dealer.

```
[INITIAL SETTINGS]
SET MMSI
SET INT ANT POS.
SET EXT ANT POS.
SET SHIP TYPE
SET I/O PORT

                  QUIT [MENU]
```

Note that if the password is wrong, “VIEW” is displayed in stead of “SET” in the figure above.

4. SET MMSI is selected; press the [ENT] key to display the SET MMSI window.

```
[SET MMSI]
MMSI:    000000000
IMO NO: 000000000
NAME:

C. SIN:
                    QUIT [MENU]
```

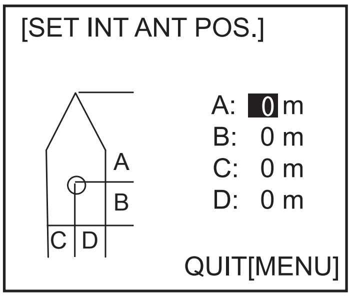
SET MMSI window

5. MMSI is selected; press the [ENT] key. By using the cursor pad, enter ship's MMSI (Maritime Mobile Service Identity) in nine digits. To set value, press ▲ or ▼ key and to change the digit, press ◄ or ► key.
6. Press the [ENT] key and the IMO NO is selected.
7. Press the [ENT] key and enter ship's IMO number in nine digits. If the IMO number has 7 digits, enter "0" twice followed by IMO number. If the ship has no IMO number, enter nine zeroes.
8. Press the [ENT] key and the NAME is selected.
9. Press the [ENT] key and enter ship's name, using up to 20 alphanumeric characters.
10. Press the [ENT] key and the C. SIN is selected.
11. Press the [ENT] key and enter call sign, using up to seven alphanumeric characters.
12. Press the [ENT] key.
13. Press the [MENU] key to save the settings.

Note: If you enter incorrect data, do the procedure from step 1.

3.2 Setting GPS Antenna Position

1. Open the INITIAL SETTINGS window, referring to the previous page.
2. Press ▲ or ▼ key to choose SET INT ANT POS. and press the [ENT] key.



SET INT ANT POS. sub-menu
(Data entry)

3. Press the [ENT] key again.
4. Enter distance for location “A” of FA-150 GPS antenna by using the cursor pad and press the [ENT] key.

   A: Distance from bow to GPS antenna position, setting range: 0-511 m
5. Press the [ENT] key and enter distance for location B, C and D similar to how you did for "A" above.

   B: Distance from stern to GPS antenna position, setting range: 0-511 m

   C: Distance from port to GPS antenna position, setting range: 0-63 m

   D: Distance from starboard to GPS antenna position, the setting range: 0-63 m
6. Press the [MENU] key to return to the INITIAL SETTINGS menu.
7. Press ▲ or ▼ key to choose SET EXT ANT POS and press the [ENT] key.
8. Enter distance for location of an external GPS antenna (if connected) similar to how you did for the internal GPS antenna.
9. Finally press the [MENU] key to save the settings.

3.3 Setting Ship Type

1. In the INITIAL SETTINGS window, press the ▲ or ▼ key to choose the SET SHIP TYPE and press the [ENT] key.

```
[SET SHIP TYPE]
TYPE NO :         0*

* * * * TYPE DETAIL * * * *
NOT AVAILABLE
```

2. Press the [ENT] key and set number for ship type by using ▲ or ▼ key, referring to the table below.

Table: Ship type

No.	Ship type
1	Future use
2	WIG
3	Vessel
4	HSC
5	Special craft
6	Passenger ships
7	Cargo ships
8	Tanker
9	Other type of ship

WIG: Wing in ground

HSC: High speed craft

(For details, see “§1.5 Setting Up for Voyage” on the operator’s manual.

3. Press the [MENU] key to save the setting.

3.4 Setting I/O Port

Setting COM port/PC port

1. In the INITIAL SETTINGS window, press ▲ or ▼ key to choose the SET I/O PORT and press the [ENT] key.

```
[SET I/O PORT]
SET COM PORT
SET PC PORT
SET LAN PORT*
SET PRIORITY

                    QUIT[MENU]
```

*: Only when LAN kit (option) attached.

SET I/O PORT menu

If you choose COM1 for example, do as follows.

4. Press the [ENT] key to display the COM1 setting window.

```
[SET COM1]
MODE  : LONG RANGE
SPEED:  IEC 61162-2

                QUIT [MENU]
```

5. Press the [ENT] key again to display the MODE setting window.

```
[SET COM1]
MODE  : LONG RANGE
SPEED:  LONG RANGE
        EXT DISPLAY
        DISABLE

                QUIT [MENU]
```

6. Press ▲ or ▼ to choose the device connected and press the [ENT] key.
   LONG RANGE: Long range communication device, for ex. Inmarsat C.
   EXT DISPLAY: External display, for ex. Radar, ECDIS, Pilotplug, etc.
   DISABLE: When the port is not used.
7. Press the [ENT] key to display the SPEED setting window.

```
[SET COM1]
MODE  : LONG RANGE
SPEED:  IEC 61162-2
        IEC 61162-1
        IEC 61162-2

                QUIT [MENU]
```

8. Press ▲ or ▼ to choose the data format, or data transmission rate.
   IEC61162-1: 4800 bps
   IEC61162-2: 38.4 Kbps
9. Press the [ENT] key.
10. Press the [MENU] key to save the settings.
11. Set up other ports similarly.
12. Set PC PORT similar to how you did for the COM PORT.

The table below shows the ports and corresponding items to be set.

Port and data format/data transmission rate

Port	External device (MODE)	Format/Rate (SPEED)
COM1	LONG RANGE	IEC61162-1 IEC61162-2
	EXT DISPLAY	IEC61162-1 IEC61162-2
	DISABLE	-
COM2	EXT DISPLAY	IEC61162-1 IEC61162-2
	MONITOR	IEC61162-1 (No use) IEC61162-2
	HI LEVEL IF	IEC61162-1 (No use) IEC61162-2
	DISABLE	-
COM3	EXT DISPLAY	IEC61162-1 IEC61162-2
	MONITOR	IEC61162-1 (No use) IEC61162-2
	HI LEVEL IF	IEC61162-1 (No use) IEC61162-2
	DISABLE	-
COM4	SENSOR	IEC61162-1 IEC61162-2
	EXT DISPLAY	IEC61162-1 IEC61162-2
	DISABLE	-
COM5	SENSOR	IEC61162-1 IEC61162-2
COM6	SENSOR	IEC61162-1 IEC61162-2 AD-10
PC	STANDARD	4800bps, 9600bps 19.2kbps, 38.4kbps, 57.6kbps
	MONITOR	4800bps, 9600bps 19.2kbps, 38.4kbps, 57.6kbps
	SERVICE	4800bps, 9600bps 19.2kbps, 38.4kbps, 57.6kbps
	BEACON	4800bps
	DISABLE	-

Note: Underline shows default.

LONG RANGE: Long range communication device, for ex. Inmarsat C.
EXT DISPLAY: External display, for ex. Radar, ECDIS, Pilotplug, etc.
SENSOR: GPS, Gyrocompass, Speedlog, ROT, etc.
HI LEVEL IF: NAVNET 2

The table below shows the ports and corresponding items to be set.

Port and data format/data transmission rate

Port	External device (MODE)	Format/Rate (SPEED)
COM1	LONG RANGE	IEC61162-1 IEC61162-2
	EXT DISPLAY	IEC61162-1 IEC61162-2
	DISABLE	-
COM2	EXT DISPLAY	IEC61162-1 IEC61162-2
	MONITOR	IEC61162-1 (No use) IEC61162-2
	HI LEVEL IF	IEC61162-1 (No use) IEC61162-2
	DISABLE	-
COM3	EXT DISPLAY	IEC61162-1 IEC61162-2
	MONITOR	IEC61162-1 (No use) IEC61162-2
	HI LEVEL IF	IEC61162-1 (No use) IEC61162-2
	DISABLE	-
COM4	SENSOR	IEC61162-1 IEC61162-2
	EXT DISPLAY	IEC61162-1 IEC61162-2
	DISABLE	-
COM5	SENSOR	IEC61162-1 IEC61162-2
COM6	SENSOR	IEC61162-1 IEC61162-2 AD-10
PC	STANDARD	4800bps, 9600bps 19.2kbps, 38.4kbps, 57.6kbps
	MONITOR	4800bps, 9600bps 19.2kbps, 38.4kbps, 57.6kbps
	SERVICE	4800bps, 9600bps 19.2kbps, 38.4kbps, 57.6kbps
	BEACON	4800bps
	DISABLE	-

Note: Underline shows default.

LONG RANGE: Long range communication device, for ex. Inmarsat C.
EXT DISPLAY: External display, for ex. Radar, ECDIS, Pilotplug, etc.
SENSOR: GPS, Gyrocompass, Speedlog, ROT, etc.
HI LEVEL IF: NAVNET 2

4. ATTACHING LAN KIT (OPTION)

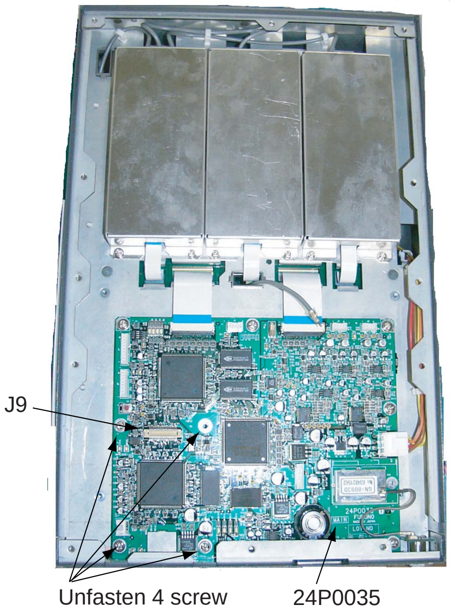
The LAN kit configures network via TCP/IP protocol

Name: LAN kit
Type: OP24-8
Code no.: 005-956-020

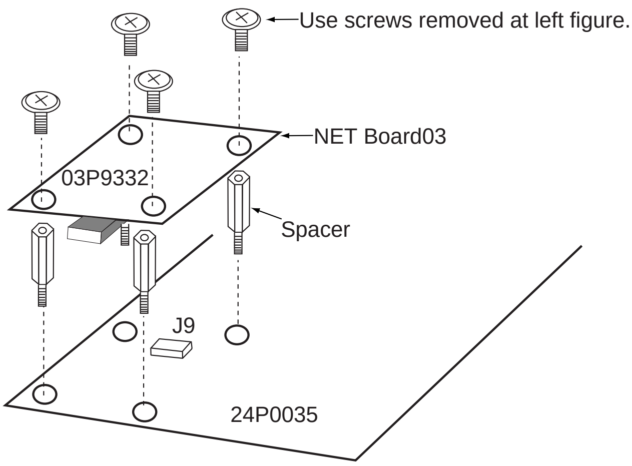
	Name	Code no.	Qty	Remark
1	NET100 board	008-535-840	1	03P9332
2	Hex. spacer	000-801-678	4	

Attaching

1. Dismount the bottom cover.
2. Attach NET100 board 03P9332 to the 24P0035 board, referring to the figure shown below.



Transponder (Bottom cover removed)



Attaching 03P9332

Setting LAN port

1. Press the [MENU] key, choose INITIAL SETTING, enter password, choose SET I/O PORT and press the [ENT] key to show the SET I/O PORT sub menu.
2. Press ▲ or ▼ to choose SET LAN PORT and press the [ENT] key.

```
[SET LAN PORT]
MODE : STANDARD
IP ADDRESS
 172. 031. 024. 001
SUB NET MASK
 255. 255. 000. 000
PORT NO. : 10000
                QUIT [MENU]
```

3. Press the [ENT] key to show the mode selecting window.
4. Press ▲ or ▼ to choose suitable mode and press the [ENT] key.
   STANDARD: When connecting a LAN device
   MONITOR: When connecting a monitor
   SERVICE: Data output for service man
   DISABLE: No connection
5. Press the [ENT] key, enter IP address in the IP ADDRESS field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255)
   Choose digit with ◄ or ► ; set value with ▲ or ▼.
6. Press the [ENT] key, enter sub net mask in the SUB NET MASK field and press the [ENT] key. (Setting range: 000.000.000.000 to 255.255.255.255)
7. Press the [ENT] key, enter port number in the PORT NO. field and press the [ENT] key. (Setting range: 0 to 65535)
8. Press the [MENU] key several times to save the settings and close the menu.

5. IEC 61162-1/2 DATA SENTENCES

IEC 61162-1/2 format data is input or output from the data port COM1-COM6. The table below shows the input/output data specifications.

Transponder

<table>
<tr><th>Port</th><th>Menu setting</th><th>Input/Output</th><th>Data format</th></tr>
<tr><td rowspan="2">COM1</td><td>LONG RANGE</td><td>Input/Output*</td><td>IEC61162-2 (38.4kbps) /
IEC61162-1 (4800bps)</td></tr>
<tr><td>EXT DISPLAY</td><td>Input/Output*</td><td>IEC61162-2 (38.4kbps) /
IEC61162-1 (4800bps)</td></tr>
<tr><td>COM2</td><td>EXT DISPLAY</td><td>Input/Output*</td><td>IEC61162-2 (38.4kbps) /
IEC61162-1 (4800bps)</td></tr>
<tr><td>COM3</td><td>EXT DISPLAY</td><td>Input/Output*</td><td>IEC61162-2 (38.4kbps) /
IEC61162-1 (4800bps)</td></tr>
<tr><td rowspan="2">COM4</td><td>SENSOR</td><td>Input*</td><td>IEC61162-2 (38.4kbps) /
IEC61162-1 (4800bps)</td></tr>
<tr><td>EXT DISPLAY</td><td>Input/Output*</td><td>IEC61162-2 (38.4kbps) /
IEC61162-1 (4800bps)</td></tr>
<tr><td>COM5</td><td>SENSOR</td><td>Input*</td><td>IEC61162-2 (38.4kbps) /
IEC61162-1 (4800bps)</td></tr>
<tr><td>COM6</td><td>SENSOR</td><td>Input*</td><td>IEC61162-2 (38.4kbps) /
IEC61162-1 (4800bps)
AD-10</td></tr>
</table>

*: See next page for details.

Input data/Sentences

Sentence (Priority)	Contents
ABM	Addressed binary and safety related message
ACA	AIS regional channel assignment message
ACK	Acknowledge alarm
AIR	AIS interrogation request
BBM	UAIS broadcast binary message
VSD	UAIS voyage static data
LRI LRF	Long Range interrogation Long Range function
DTM	Datum reference
GNS>GLL>GGA>RMC	Position
VBW>RMC>VTG>OSD	Speed over ground
RMC>VTG>OSD	Course over ground
HDT>OSD>AD-10 format	Heading
GBS	GNSS satellite fault detection
ROT>Calculated value	Rate of turn
SSD	UAIS ship static data

Output data/Sentences

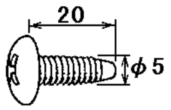
Sentence	Contents
AIVDM	VHF data-link message
AIVDO	UAIS VHF data-link own-vessel report
AIABK	UAIS addressed and binary broadcast acknowledgement
AILRF AILR1 AILR2 AILR3	Long-range function Long-range reply with destination for function request “A” Long-range reply for function requests “B, C, E and F” Long-range reply for function requests “I, O, P, U and W”
AIACA	AIS regional channel assignment message
AIALR	Set alarm state
AITXT	Text transmission
AIACS	Channel management information source

FURUNO

CODE NO.	005-955-550	24AC-X-9402 -1
TYPE	CP24-00501	1/1

工事材料表
INSTALLATION MATERIALS

For FA-1501

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1種 SELF-TAPPING SCREW		5X20 SUS304		4	
			CODE NO.	000-802-081		

24AC-X-9402

FURUNO ELECTRIC CO ., LTD.

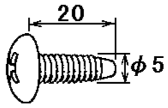
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	005-955-940	24AC-X-9405 -0
TYPE	CP14-06001	1/1

工事材料表
INSTALLATION MATERIALS

For FA-1502

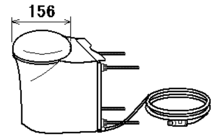
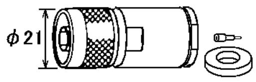
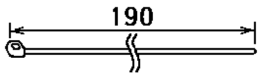
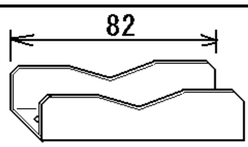
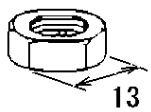
番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ SELF-TAPPING SCREW		5X20 SUS304 1種 ｸﾛ		4	
			CODE NO.	000-802-840		

FURUNO ELECTRIC CO .,LTD.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

PACKING LIST

GVA-100,GVA-100-T

NAME	OUTLINE	DESCRIPTION/CODE №	Q'TY
ユニット UNIT			
複合空中線部 GPS/VHF COMBINED ANTENNA		GVA-100 000-053-810 **	1
工事材料 INSTALLATION MATERIALS		**CP24-00141**	
ｺﾈｸﾀ(N) CONNECTOR		N-P-8DFB 座金付き 000-140-463	2
ｺﾝﾍﾞｯｸｽ PLASTIC BAND		CV-200HT 000-809-226	2
ｱﾝﾃﾅ取付金具 ANTENNA FIXING BRACKET		24-003-3015-0 100-302-670	2
ﾐｶﾞｷ平座金 FLAT WASHER		M8 SUS304 000-864-130	4
六角ﾅｯﾄ　１種 HEX.NUT		M8 SUS304 000-863-110	8

1.ｺｰﾄﾞ番号末尾の[**]は、選択品の代表型式/ｺｰﾄﾞを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

（略図の寸法は、参考値です。　DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

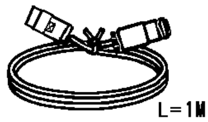
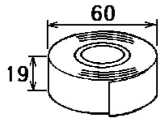
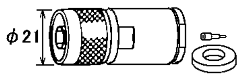
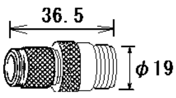
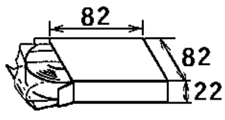
FURUNO

CODE NO.	005-955-560	24AC-X-9403 -0
TYPE	CP24-00502	1/1

工事材料表

INSTALLATION MATERIALS

For GPA-017S/GSC-001

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	変換ｹｰﾌﾞﾙ組品 CONVERT CABLE ASSY.		NJ-TP-3DXV-1		1	
			CODE NO.	000-123-809		
2	ﾋﾞﾆｰﾙﾃｰﾌﾟ VINYL TAPE		NO360 0.2X19X10000 ｸﾛ ｴｽﾛﾝ		1	
			CODE NO.	000-835-215		
3	ｺﾈｸﾀ(N) CONNECTOR		N-P-8DFB 座金付き		2	
			CODE NO.	000-140-463		
4	ｺﾈｸﾀ CONNECTOR		TNCP-NJ		1	
			CODE NO.	000-146-177		
5	絶縁ﾃｰﾌﾟ SELF-BONDING TAPE		Uﾃｰﾌﾟ 0.5X19X5M		1	
			CODE NO.	000-800-985		

24AC-X-9403

FURUNO ELECTRIC CO ., LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

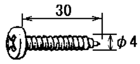
FURUNO

CODE NO.	005-950-730	24AA-X-9404 -0
TYPE	CP24-00101	1/1

工事材料表

INSTALLATION MATERIALS

For DB-1

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+ﾅﾍﾞﾀｯﾋﾟﾝﾈｼﾞ SELF-TAPPING SCREW		4X30 SUS304 1ｼｭ CODE NO. 000-809-321	2	

24AA-X-9404

FURUNO ELECTRIC CO.,LTD.

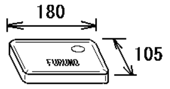
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	004-366-960	24AC-X-9501 -0
TYPE	FP14-02801	1/1

付属品表
ACCESSORIES

For FA-1502

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	保護カバー COVER		20-016-1091-2 CODE NO. 100-297-032	1	

24AC-X-9501

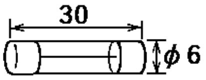
FURUNO ELECTRIC CO .,LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	005-955-930	24AC-X-9301 -0 1/1
TYPE	SP24-00101	BOX NO. P

SHIP NO.	SPARE PARTS LIST FOR	U S E	SETS PER VESSEL
	For FA-1502		

ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY WORKING PER VES	SPARE	REMARKS/CODE NO.
1	ﾋｭｰｽﾞ FUSE		FGBO-A 3A AC125V			2	000-549-063

MFR'S NAME	FURUNO ELECTRIC CO.,LTD.	DWG NO.	24AC-X-9301	1/1

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

Antenna Cable Set

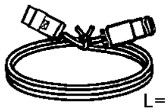
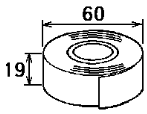
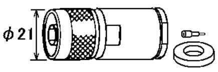
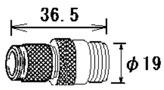
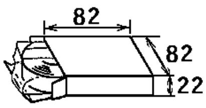
CP20-02700 (004-381-160)
CP20-02710 (004-381-170)

FURUNO

CODE NO.	004-381-190	20AX-X-9401 -0
TYPE	CP20-02701	1/1

工事材料表

INSTALLATION MATERIALS

番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	変換ｹｰﾌﾞﾙ組品 CONVERT CABLE ASSY.	 L=1M	NJ-TP-3DXV-1 CODE NO. 000-123-809	1	
2	ﾋﾞﾆｰﾙﾃｰﾌﾟ VINYL TAPE		N0360 02X19X10000 ク ロ エスロン CODE NO. 000-835-215	1	
3	ｺﾈｸﾀ(N) CONNECTOR		N-P-8DFB CODE NO. 000-111-549	1	
4	ｺﾈｸﾀ CONNECTOR		TNCP-NJ CODE NO. 000-146-177	1	
5	絶縁ﾃｰﾌﾟ SELF-BONDING TAPE		Uﾃｰﾌﾟ 0.5X19X5M CODE NO. 000-800-985	1	

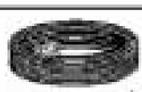
FURUNO

CODE NO.		20AG-X-9404 -1
TYPE		1/1

工事材料表

INSTALLATION MATERIALS

GP-80, GP-90, SC-55, GP-3500/F
GP-1850, GP-1650, FA-100, GP-1640/F
SC-60/120, GD/GP-280/680/380

番 号 NO.	名 称 NAME	略 図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｱﾝﾃﾅｹｰﾌﾞﾙ組品 ANTENNA CABLE ASSY.	 L=30M	8D-FB-CV *30M* CODE NO. 000-111-547	1	選択 TO BE SELECTED
2	ｹｰﾌﾞﾙ組品 CABLE ASSY.	 L=50M	8D-FB-CV *50M* CODE NO. 000-117-599	1	選択 TO BE SELECTED

Antenna cable Set

CP24-00300(000-041-938)

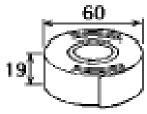
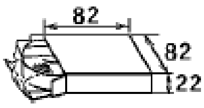
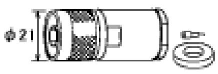
CP24-00310(000-041-939)

FURUNO

CODE NO.	005-955-570	24AC-X-9401 -0	
TYPE	CP24-00301		1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ビニールテープ VINYL TAPE		N0360 0.2X19X10000 クロ エスロン CODE NO. 000-835-215	1	
2	絶縁テープ SELF-BONDING TAPE		Uテープ 0.5X19X5M CODE NO. 000-800-985	1	
3	コネクタ(N) CONNECTOR		N-P-8DFB CODE NO. 000-111-549	1	

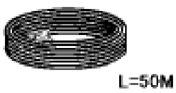
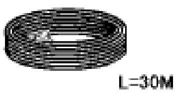
FURUNO

CODE NO.		14BN-X-9405 -1	
TYPE			1/1

工事材料表

INSTALLATION MATERIALS

GP-3100/3050、GP-188/3100MARK-2、GP-3300

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	アンテナケーブル組品 CABLE ASSY.		8D-FB-CV *50M* CODE NO. 000-117-599	1	選択 TO BE SELECTED
2	アンテナケーブル組品 ANTENNA CABLE ASSY.		8D-FB-CV *30M* CODE NO. 000-111-547	1	選択 TO BE SELECTED

FURUNO

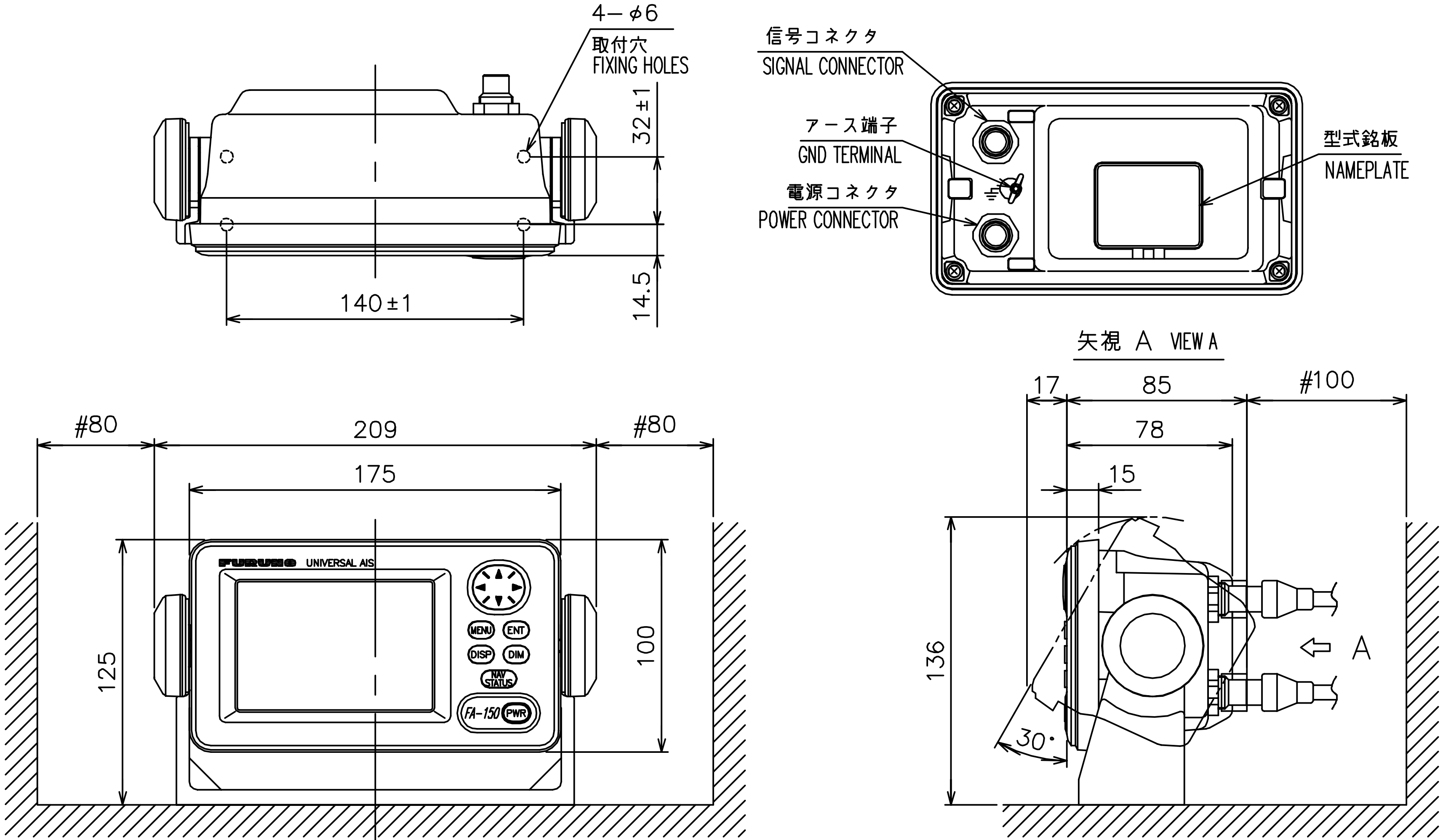


表 1 TABLE 1

寸法区分（ｍｍ） DIMENSIONS	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３

注 記

1） 指定外寸法公差は表１による。

2） ＃印寸法は最小サービス空間寸法とする。

3） 取付用ネジはトラスタッピンネジ呼び径５×２０を使用のこと。

4） 装備ケーブルはサービス時、表示部を前方に
十分引き出せるよう余裕を持たせること。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE SELF-TAPPING SCREWS 5X20 FOR FIXING THE UNIT.
4. LEAVE ENOUGH SLACK IN CABLING SO UNIT CAN BE DRAWN FORWARD WITHOUT DISCONNECTING CABLING.

DRAWN	Dec. 14, '04 E. MIYOSHI		TITLE	FA-1502
CHECKED	TAKAHASHI.T		名称	表示部（卓上装備）
APPROVED	Y. Hatai	FA-150		外寸図
SCALE	1/3 MASS 0.55 ±10% kg		NAME	MONITOR UNIT (TABLETOP MOUNT)
DWG No.	C4431-G01- C	24-006-300G-2		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

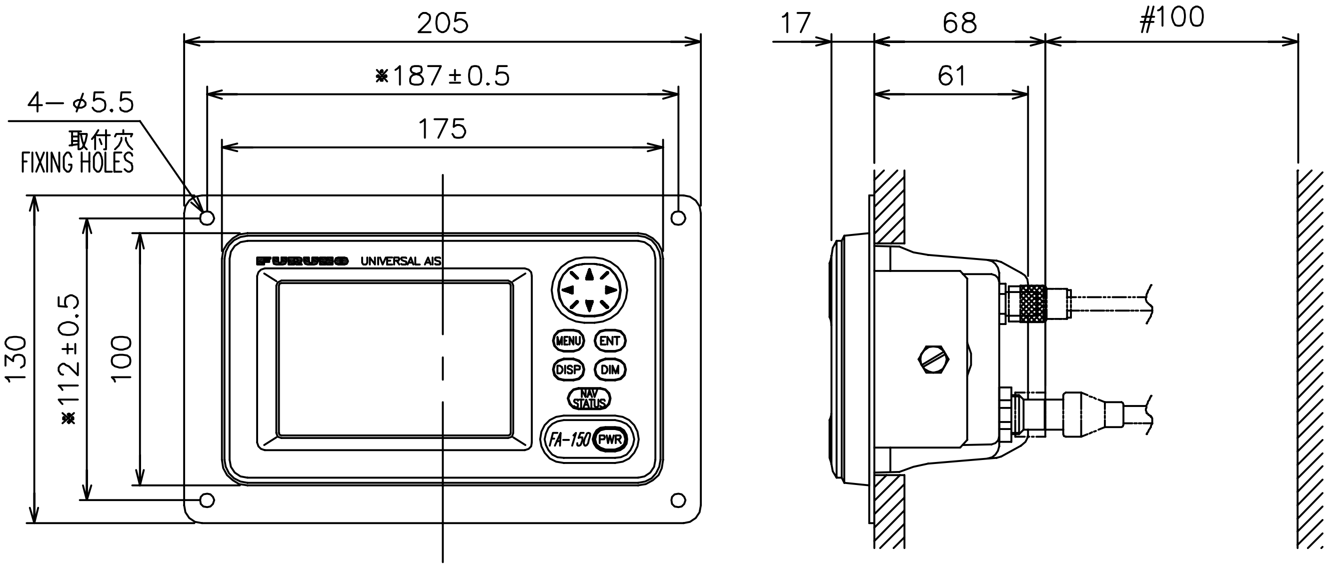
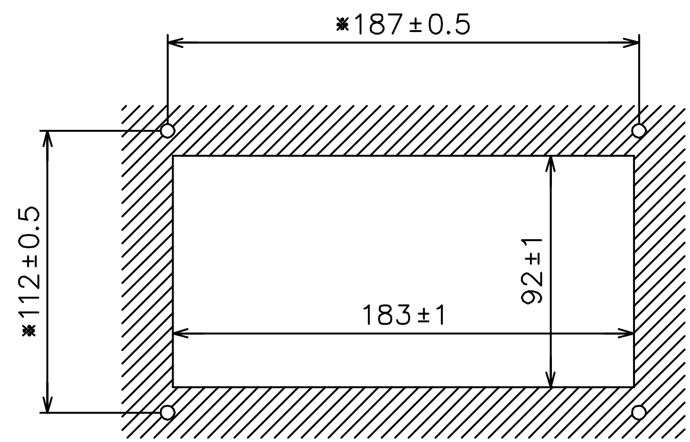


表 1 TABLE 1

寸法区分(mm) DIMENSIONS	公差(mm) TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3



取付穴寸法図
CUTOUT DIMENSIONS

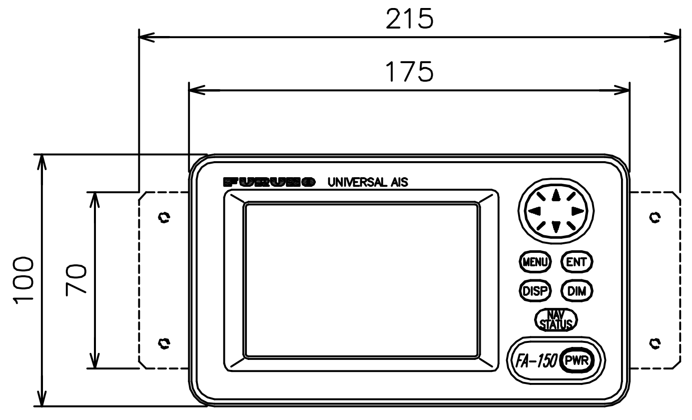
注　記 1） #印寸法は最小サービス空間寸法とする。
2） 指定外寸法公差は表1による。
3） 取付用ネジはトラスタッピンネジ呼び径5×20を使用のこと。
4） ※印寸法は取付穴位置寸法とする。

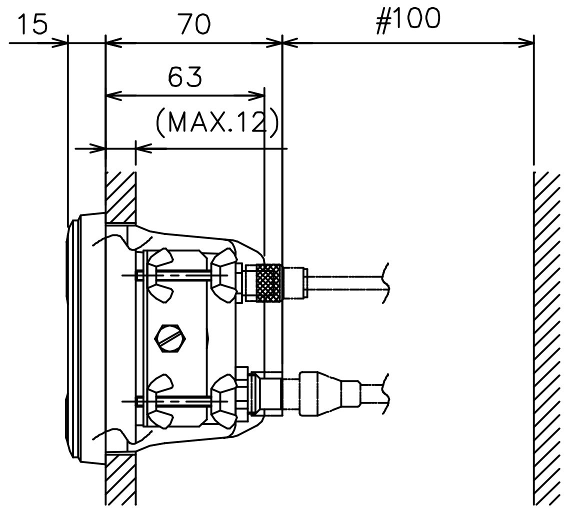
NOTE
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE SELF-TAPPING SCREWS 5x20 FOR FIXING THE UNIT.
4. ※: DIMENSIONS FOR FIXING HOLE POSITIONS.

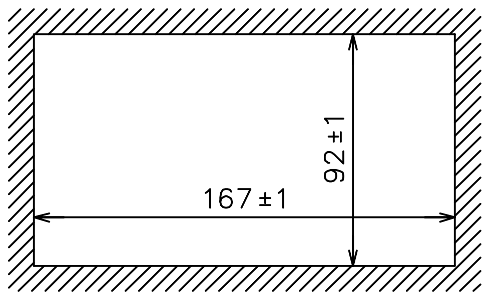
DRAWN	MAY 16,.'05 E. MIYOSHI	TITLE	FA-1502
CHECKED	TAKAHASHI. T	名称	表示部(埋込装備F)
APPROVED	Y. Hatai	FA-150	外寸図
SCALE	1/3 MASS 0.54 kg ±10%	NAME	MONITOR UNIT (FLUSH MOUNT F)
DWG.No.	C4431-G03- B	24-006-310G-0	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO







取付穴寸法図
CUTOUT DIMENSIONS

表 1 TABLE 1

寸法区分（ｍｍ） DIMENSIONS	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３

注 記 1） ＃印寸法は最小サービス空間寸法とする。
2） 指定外の寸法公差は表１による。

NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

DRAWN Feb. 16, '05 E. MIYOSHI		TITLE	FA-1502
CHECKED TAKAHASHI. T		名称	表示部(埋込装備S)
APPROVED Y. Hatai	FA-150		外寸図
SCALE 1/3 MASS 0.56 ±10% kg		NAME	MONITOR UNIT (FLUSH MOUNT S)
DWG.No. C4431-G04- A	24-006-320G-0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

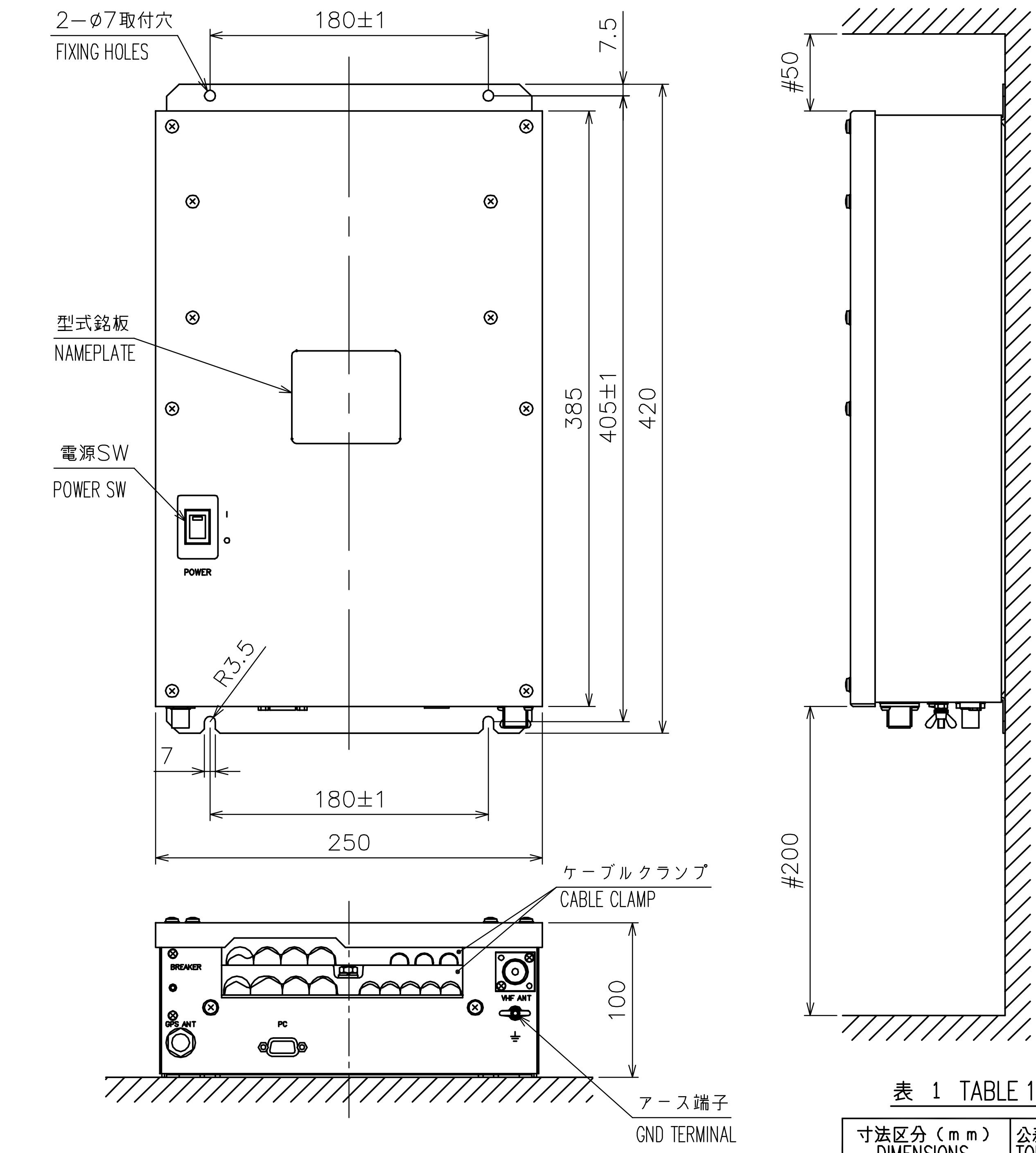


表 1 TABLE 1

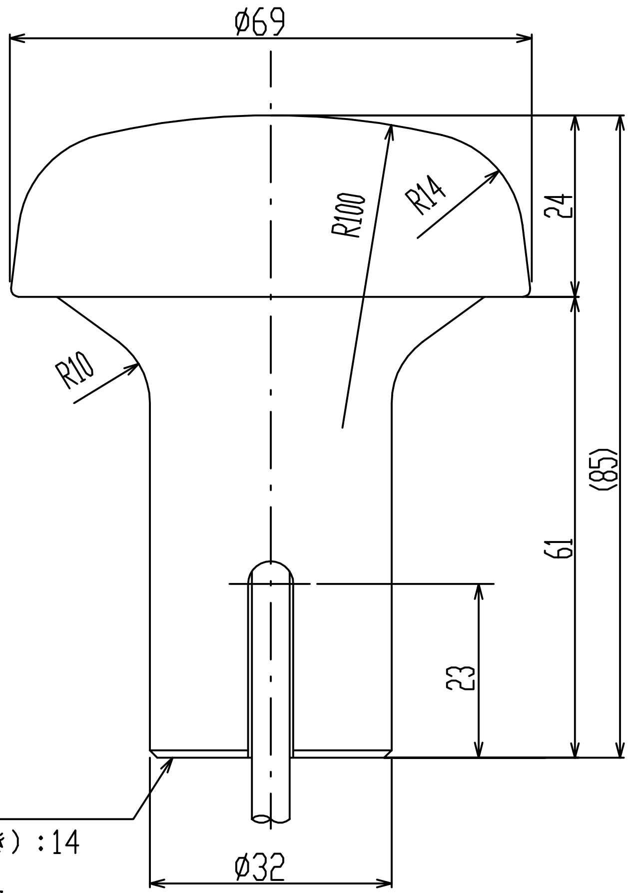
寸法区分（mm） DIMENSIONS	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

注　記　1）指定外の寸法公差は表１による。
2）#印寸法は最小サービス空間寸法とする。
3）取付用ネジはM5ボルト、またはタッピンネジ呼び径5X20を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M5 BOLTS OR SELF-TAPPING SCREWS 5X20 FOR FIXING THE UNIT.

DRAWN Nov. 22, '04 E. MIYOSHI		TITLE	FA-1501
CHECKED TAKAHASHI. T		名称	トランスポンダ部
APPROVED Y. Hatai	FA-150		外寸図
SCALE 1/4 MASS 7.3 ±10% kg		NAME	TRANSPONDER UNIT
DWG.No. C4431-G02- B	24-006-110G- 1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

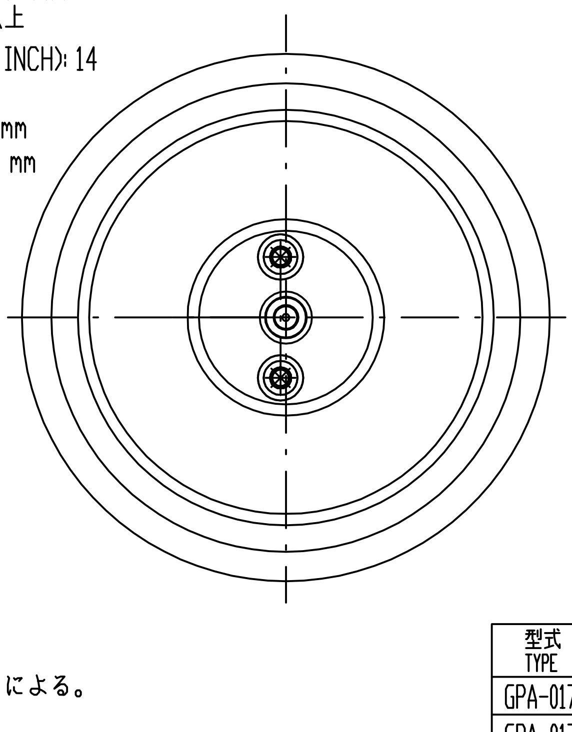


寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
L ≦ 50	±1.5
50 ＜ L ≦ 100	±2.5
100 ＜ L ≦ 500	±3

表1 TABLE 1

1-14UNS1B
ねじ山数(25.4mmにつき):14
ピッチ: 1.8143 mm
オネジ有効長さ: 24.17 mm
オネジ有効径:19 mm以上

THREAD PER 25.4mm (1 INCH): 14
PITCH: 1.8143 mm
THREAD LENGTH: 15.17 mm
PITCH DIAMETER: 24.17 mm



注記
指定外の寸法公差は表1による。

NOTE
TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

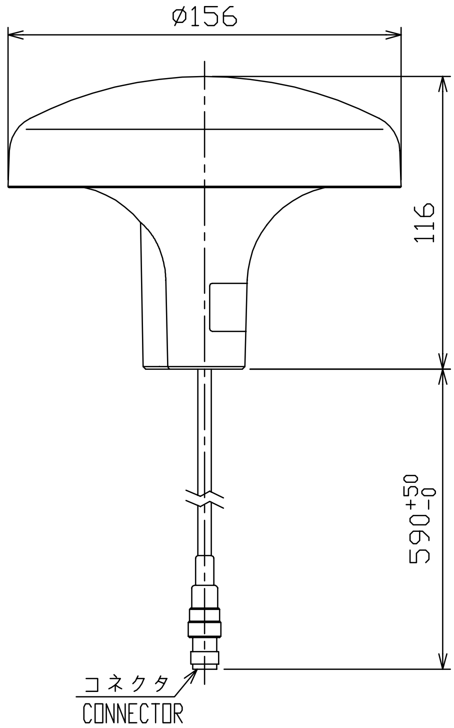
型式 TYPE	ケーブル長(m) CABLE LENGTH	プラグ PLAG	質量(kg±10%) MASS
GPA-017	10	TNC-P-3	0.6
GPA-017S	0.2	TNC-J-3	0.15

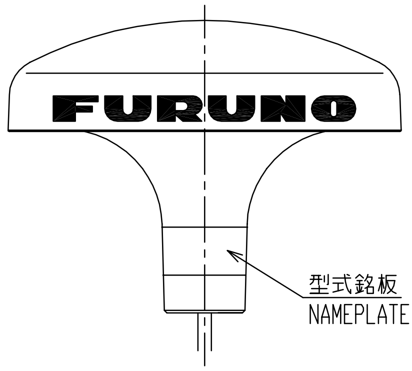
表2 TABLE 2

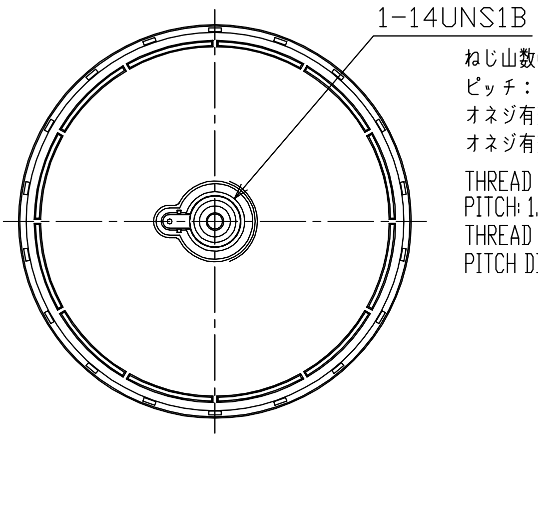
DRAWN Feb. 19 '03 T.YAMASAKI		TITLE	GPA-017/017S
CHECKED Feb. 19 '03 Y.KIMURA		名称	空中線部
APPROVED Feb. 19, '03 Y. Kimura			外寸図
SCALE 1/1	MASS TABLE 2 表2参照	NAME	ANTENNA UNIT
DWG.No. C4384-G04- J			OUTLINE DRAWING

寸法区分（ｍｍ）DIMENSION	公差（ｍｍ）TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３

表 1 TABLE 1







ねじ山数(25.4mmにつき)： 14
ピッチ： 1.8143 mm
オネジ有効長さ： 15.17 mm
オネジ有効径： 24.17 mm

THREAD PER 25.4mm (1 INCH): 14
PITCH: 1.8143 mm
THREAD LENGTH: 15.17 mm
PITCH DIAMETER: 24.17 mm

注　記　１）指定外の寸法公差は表１による。

NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENDIONS.

DRAWN May 12 '03 T. YAMASAKI		TITLE	GSC-001-FA
CHECKED May 12 '03 T.Matsuguchi		名称	ＧＰＳアンテナ部
APPROVED May 20 '03 T. Matsuguchi	FA-100		外寸図
SCALE 1/3	MASS ±10% 0．47 kg 質量はケーブルを含む。MASS W/ CABLE.	NAME	GPS ANTENNA UNIT
DWG.No. C4417-G07- B	24-003-330G-0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

D-7

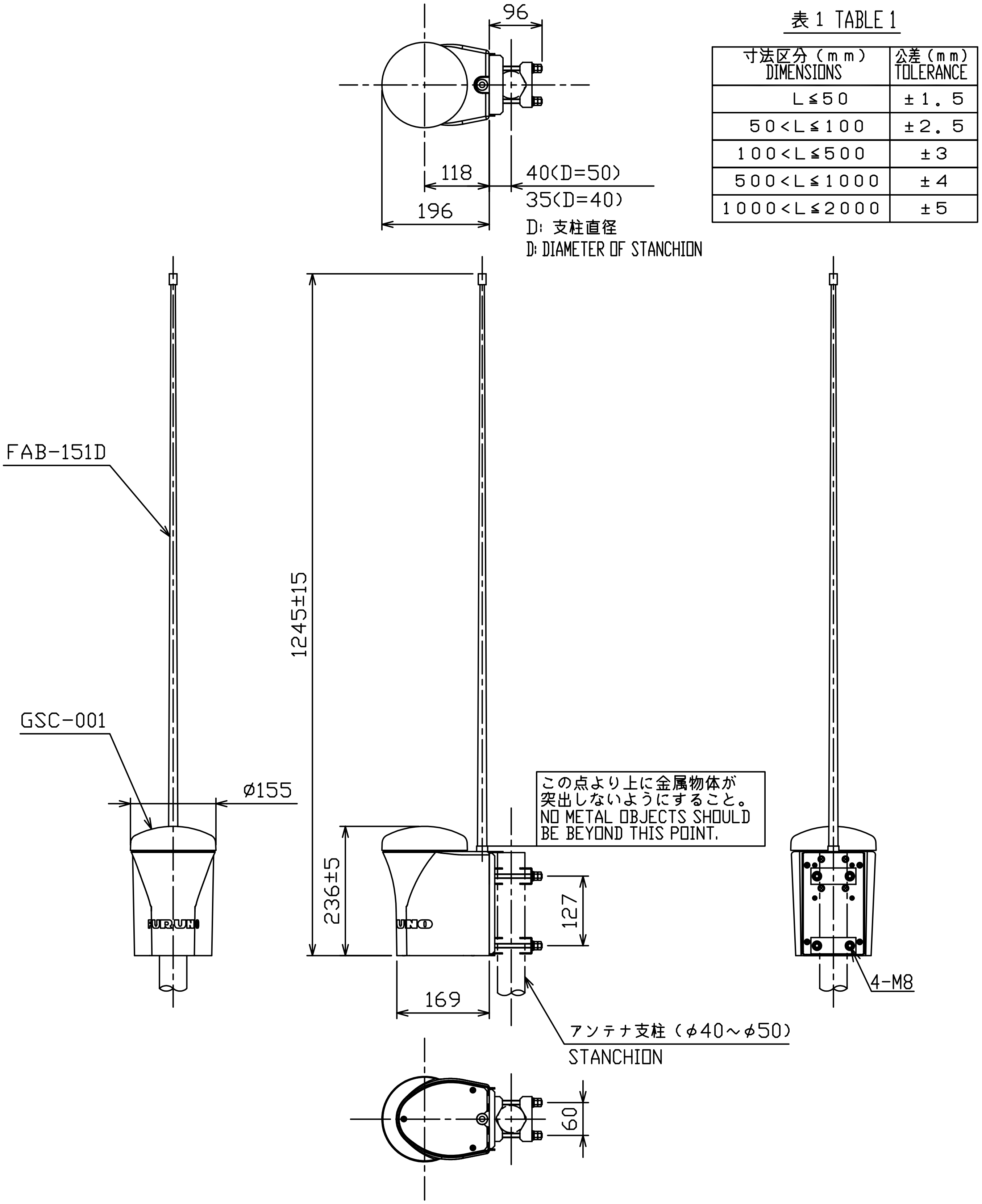


表１ TABLE 1

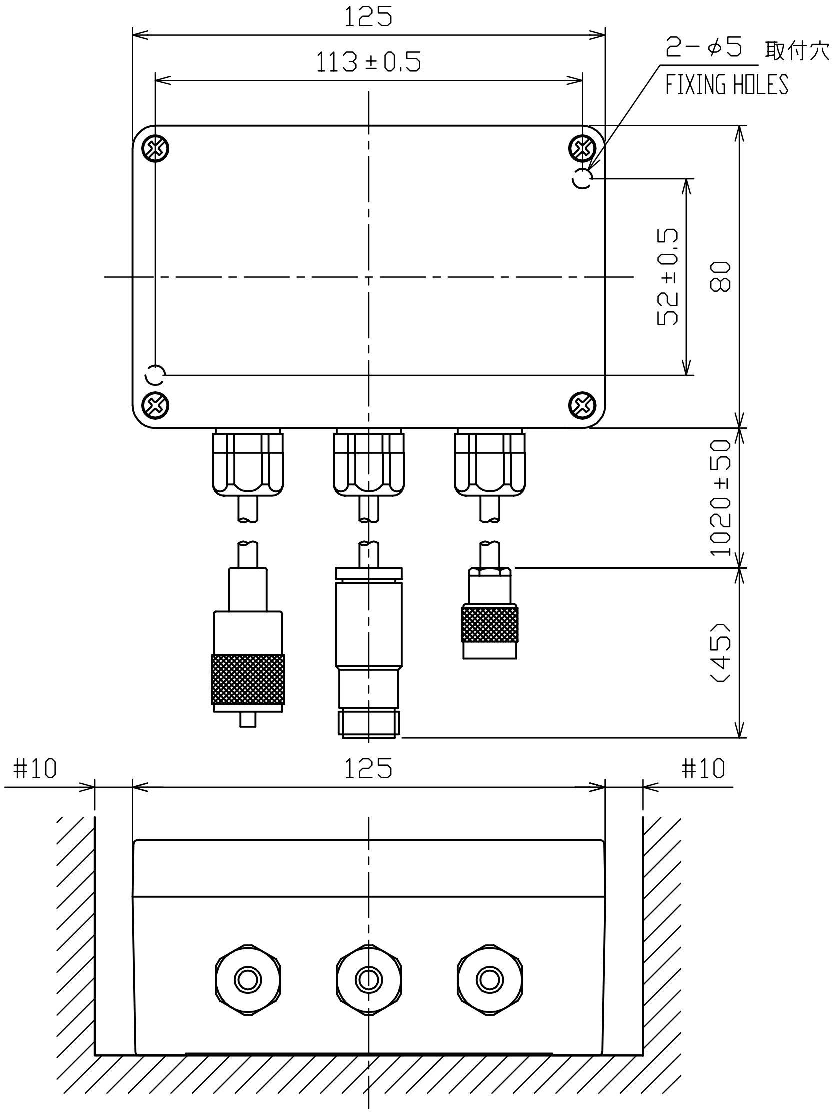
寸法区分（mm） DIMENSIONS	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5

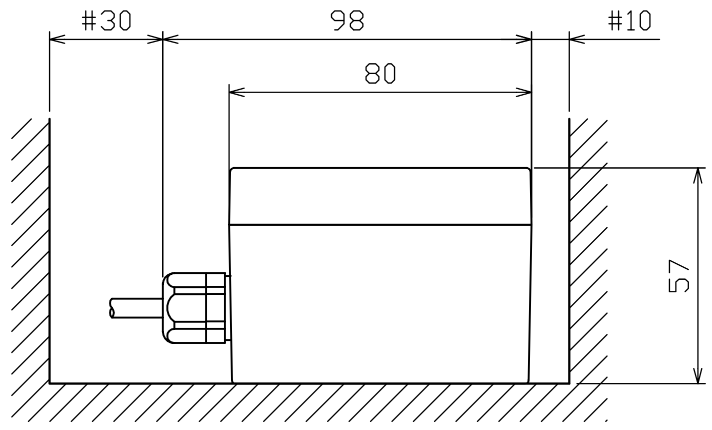
注　記　１）指定外の寸法公差は表１による。

NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

DRAWN Feb. 9 '05 T.YAMASAKI			TITLE GVA-100
CHECKED Feb. 9 '05 T.MATSUGUCHI			名称 GPS/VHF複合空中線部
APPROVED Feb.22'05 T. Matsuguchi	FA-100		外寸図
SCALE 1/10	MASS 3.3 kg ±10%		NAME GPS/VHF COMBINED ANTENNA
DWG.No. C4417-G02-F	24-003-301G-1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.





寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

表１ TABLE 1

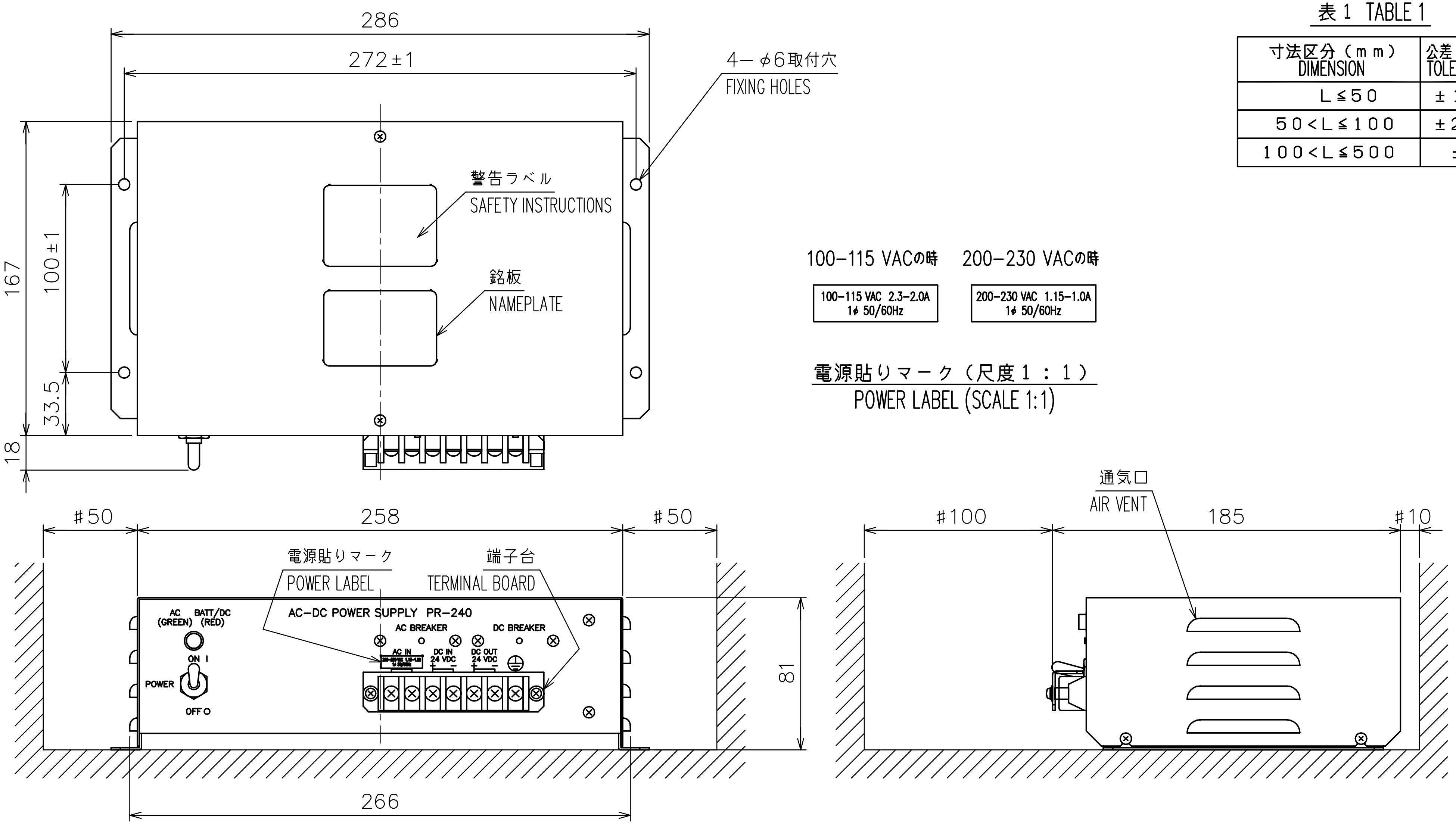
注 記
1）＃印寸法は最小サービス空間寸法とする。
2）指定外の寸法公差は表１による。
3）取付用ネジは＋ナベタッピンネジ４×３０を使用のこと。

NOTE
1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE TAPPING SCREWS 4x30 FOR FIXING THE UNIT.

DRAWN Jan. 9 '03 T.YAMASAKI		TITLE	DB-1
CHECKED Jan. 9 '03 Y.KIMURA		名称	分配器 外寸図
APPROVED Jan. 9, '03 Y. Kimura	FA-100		
SCALE 1/2 MASS 0.85 kg ±10%		NAME	DISTRIBUTOR OUTLINE DRAWING
DWG No. C4417-G04-C	24-003-320G-4		

FURUNO ELECTRIC CO., LTD.

FURUNO



100−115 VACの時　200−230 VACの時

100−115 VAC 2.3−2.0A 1φ 50/60Hz	200−230 VAC 1.15−1.0A 1φ 50/60Hz

電源貼りマーク（尺度１：１）
POWER LABEL (SCALE 1:1)

表 1 TABLE 1

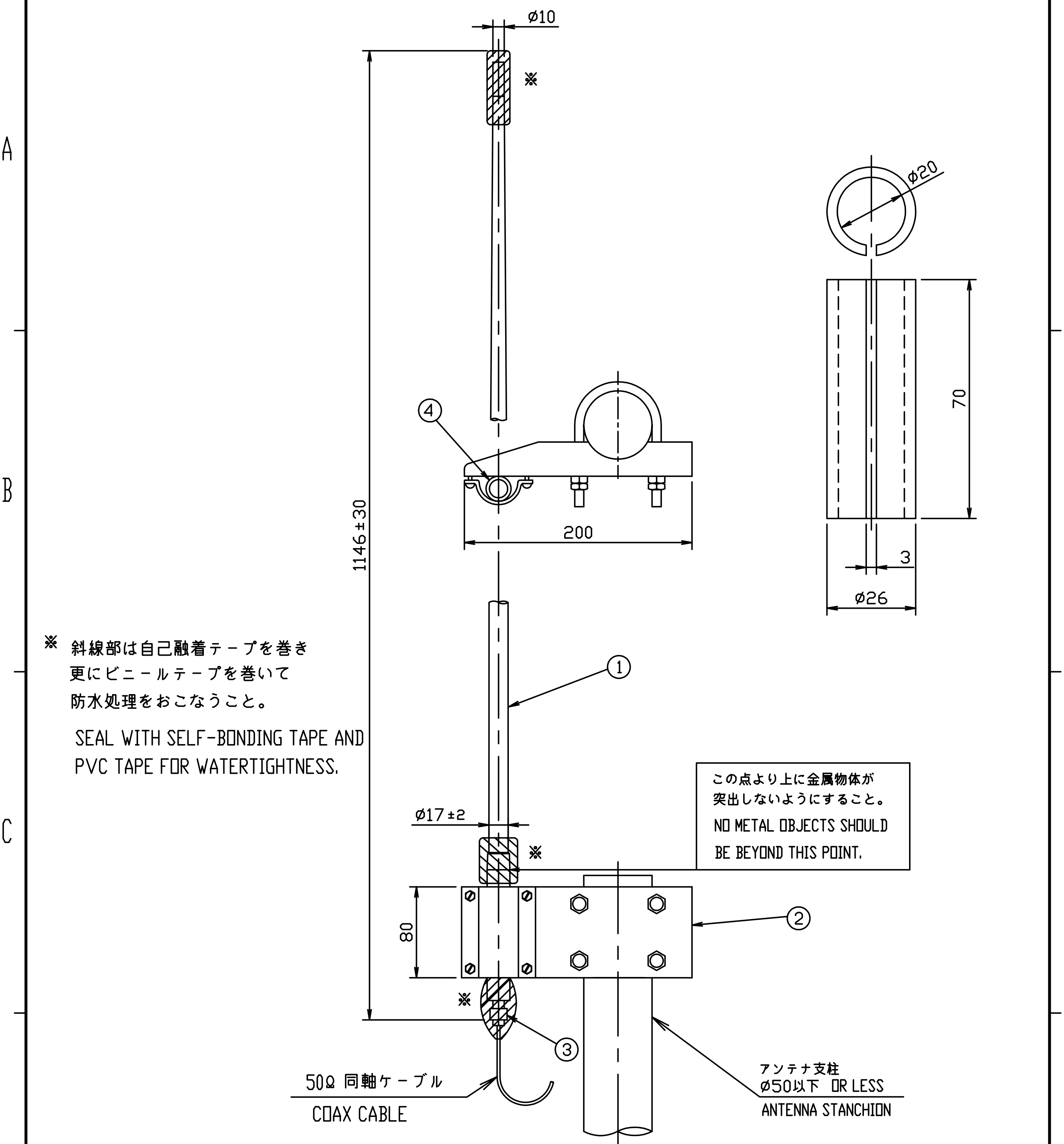
寸法区分（ｍｍ） DIMENSION	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３

注　記　１）指定なき寸法公差は表１による。
２）#印寸法は推奨する最小サービス空間寸法とする。
３）取付用ネジは＋トラスタッピンネジ 呼び径４ｘ１６を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS 4x16 FOR FIXING THE UNIT.

DRAWN Mar. 3 '04 T.YAMASAKI		TITLE	PR-240-CE
CHECKED Mar. 3 '04 T.TAKENO		名称	AC/DC電源ユニット 外寸図
APPROVED Mar.11'04 H.Hayashi			
SCALE 1/3	MASS 2.8 kg ±10%	NAME	AC/DC POWER SUPPLY UNIT OUTLINE DRAWING
DWG No. C5003-G03- F	24-003-500G-3		

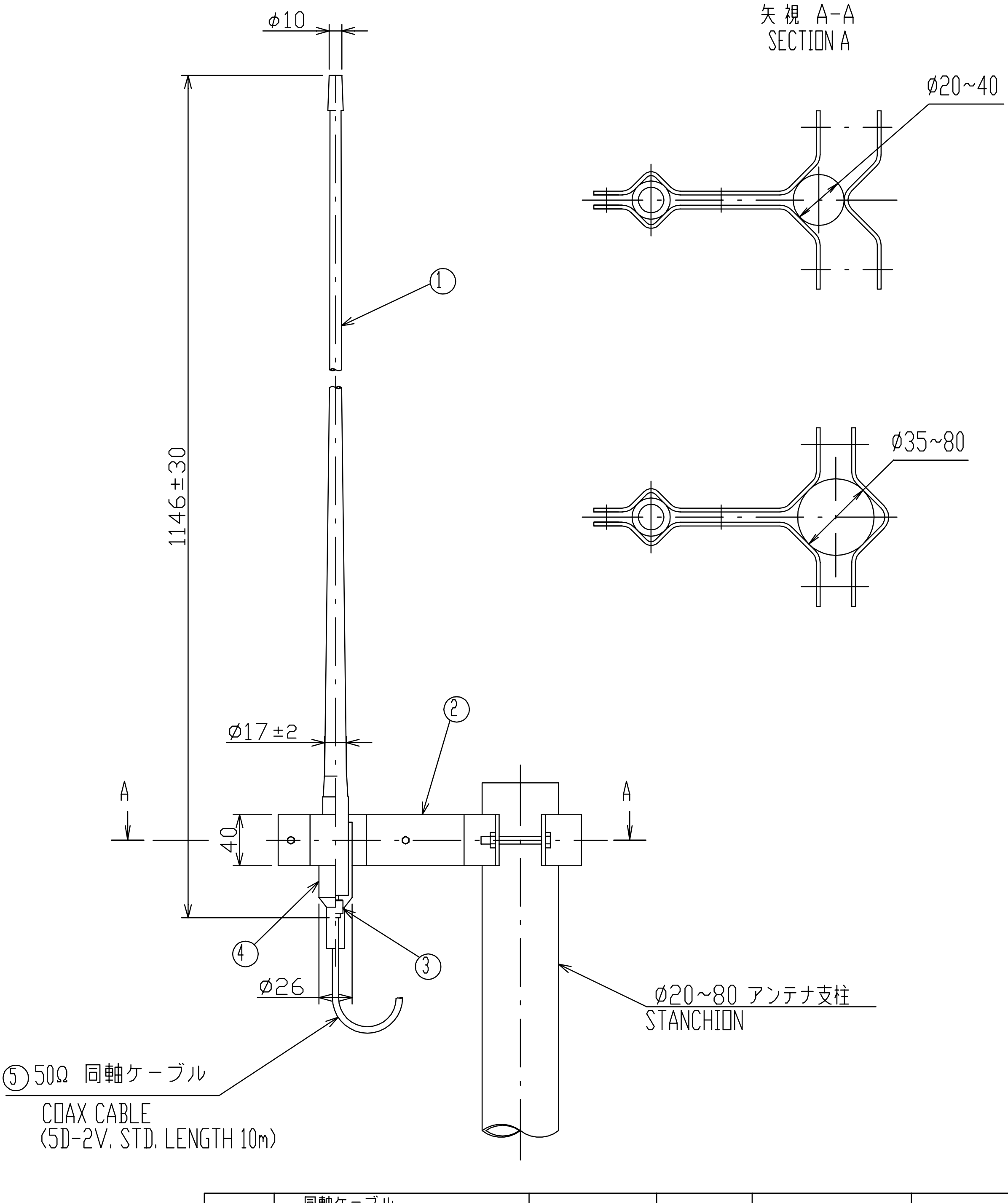
FURUNO ELECTRIC CO., LTD.



品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.No.	摘要 REMARKS
4	固定用パイプ LINER PIPE	硬質塩ビ VINYL CHLORIDE	1		
3	同軸コネクタ COAX. CONNECTOR		1		M-R
2	アンテナ取付金具 ANTENNA BRACKET	SUS	1 式 SET	4-310071	0.6kg
1	アンテナ棒 ANTENNA ELEMENT	FRP	1		0.25kg

DRAWN Feb. 1 '05 T.YAMASAKI			TITLE FAB-151D
CHECKED Feb. 1 '05 T.MATSUGUCHI			名称 150MHz ホイップアンテナ
APPROVED Feb.02'05 T.Matsuguchi			外寸図
SCALE 1/5	MASS 0.85 kg ±10%		NAME 150MHz WHIP ANTENNA
DWG.No. C5013-019-J		4-110718	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

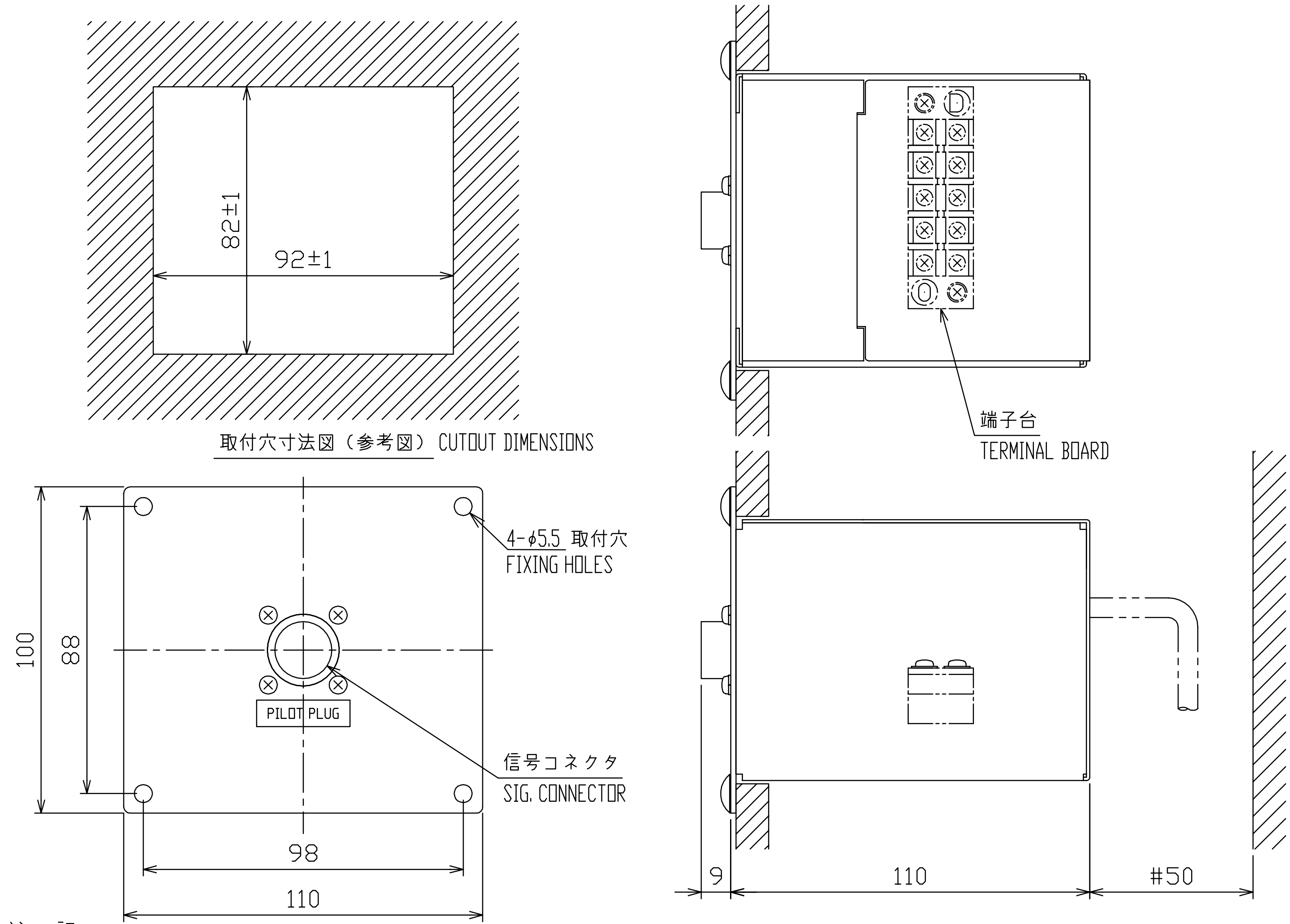


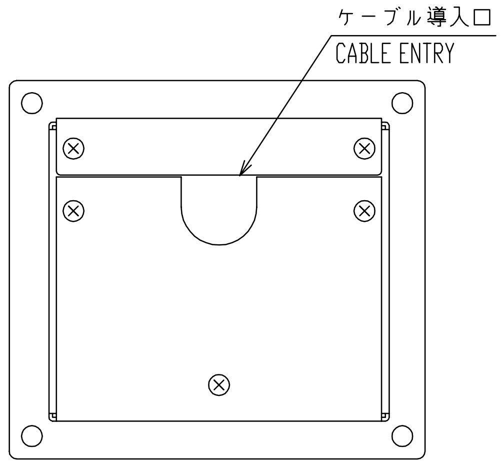
品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.No.	摘要 REMARKS
5	同軸ケーブル 50Ω COAX. CABLE		10m	5D-2V	
4	塩ビキャップ CONNECTOR CAP		1		
3	同軸コネクタ COAX. CONNECTOR		2	M-P-5	
2	アンテナ取付金具 ANTENNA BRACKET		1 式 SET		t2
1	アンテナ棒 ANTENNA ELEMENT	FRP	1	150M-W2VN	0.25kg

DRAWN	Nov. 26 '03 T.YAMASAKI	TITLE	150M-W2VN
CHECKED	Nov. 26 '03 T.TAKENO	名称	150MHzホイップアンテナ
APPROVED	Nov.28'03 T. Matsuguchi		外寸図
SCALE 1/5	MASS 0.7 kg ±10%	NAME	150MHz WHIP ANTENNA
DWG.No.	C5011-042- C		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO





寸法区分（ｍｍ） DIMENSION	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０＜Ｌ≦１００	±２．５
１００＜Ｌ≦５００	±３

表 1 TABLE 1

注　記

１） ＃印寸法は推奨するサービス空間寸法。

２） 指定外の寸法公差は表１による。

３） 取付にはＭ５ボルト、またはトラスタッピンネジ呼び径５を使用のこと。

NOTE

1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
3. USE M5 BOLTS OR TAPPING SCREWS φ5 FOR FIXING THE UNIT.

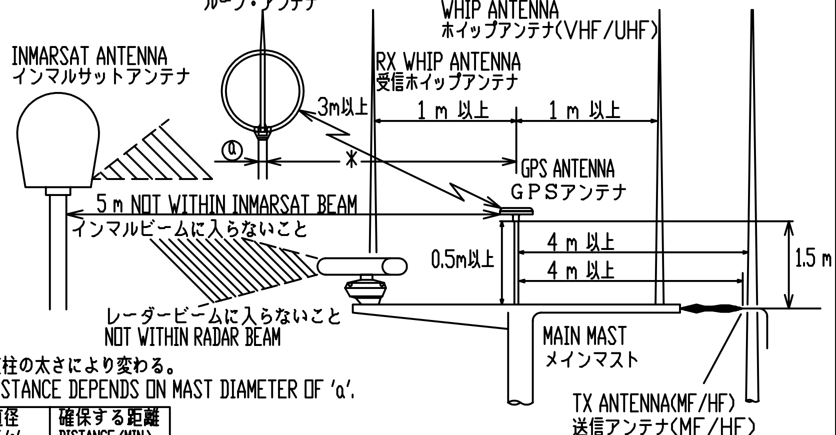
DRAWN Oct. 2 '03 T.YAMASAKI		TITLE	OP24-3
CHECKED Oct. 2 '03 T.MATSUGUCHI		名称	パイロットプラグユニット
APPROVED Oct.02'03 T.Matsuguchi	FA-100		外寸図
SCALE 1/2	MASS 0.58 ±10% kg	NAME	PILOT PLUG UNIT
DWG.No. C4417-G08- D	24-003-420G-1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

取付場所
MOUNTING LOCATION

他の機器のアンテナから下の図の距離以上離す。

THIS FIGURE SHOWS THE SEPARATION DESTANCES FROM OTHER ANTENNAS TO AVOID MUTUAL INTERFERENCE.



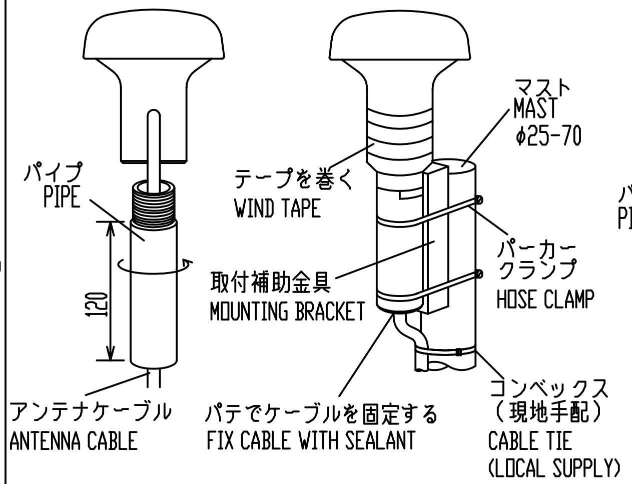
*：支柱の太さにより変わる。

*：DISTANCE DEPENDS ON MAST DIAMETER OF 'a'.

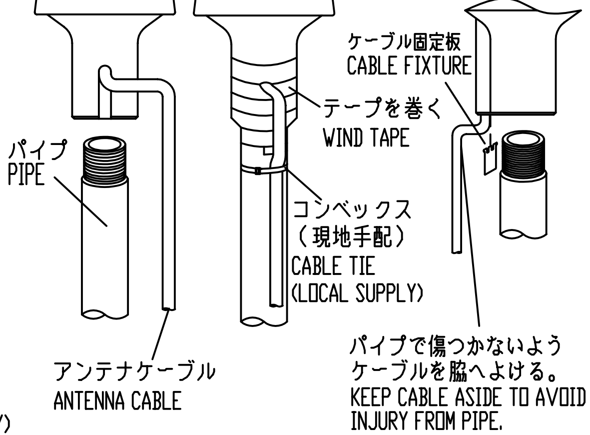
a の直径 DIA. OF 'a'	確保する距離 DISTANCE (MIN.)
10 cm	1.5 m
30 cm	3 m

A）マストへの取付け　MAST MOUNTING

a)マスト取付金具CP20-01111(工事材料)でマストに固定する。
USE MAST MOUNTING KIT CP20-01111.



b)パイプのみを使うとき
USE A PIPE ONLY.

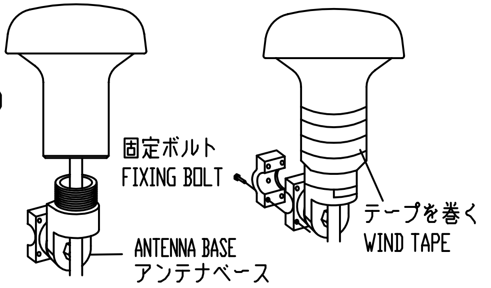


B）スタンションやパルピットにつけるとき

レール用アンテナベース No.13-RC5160
（取付可能レール直径：φ19~φ32）
（コード番号：000-806-114）

HANDRAIL MOUNTING

USE HANDRAIL MOUNTING BASE No.13-RC5160 (CODE No.000-806-114, OPTION).
THE DIAMETER OF THE HANDRAIL MAY BE FROM φ19mm TO φ32mm.

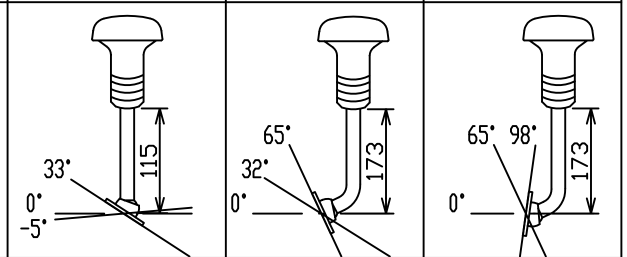


注記　1）パイプやアンテナベースはアンテナユニットにねじ込んだ後に固定する。
2）アンテナを固定するときはパイプ（アンテナベース）をアンテナにねじ込むこと。
アンテナ側をねじるとコネクタ部やケーブルに無理がかかり、故障の原因となる。

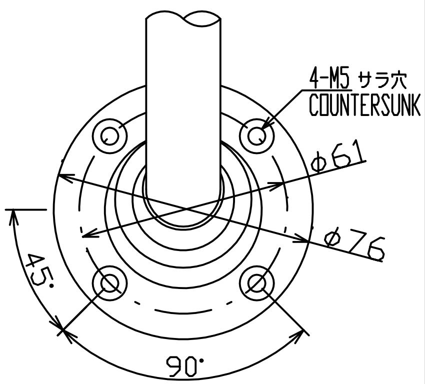
NOTE 1. FASTEN PIPE(ANTENNA BASE) TO ANTENNA UNIT FIRST THEN FIX THEM TO MAST OR HANDRAIL.
2. WHEN FIXING ANTENNA, TURN PIPE OR ANTENNA BASE; NOT THE ANTENNA.
TURNING THE ANTENNA MAY TWIST THE CABLE AND PLACE STRESS ON CONNECTOR.

C）取付ける場所が傾斜しているとき　ANTENNA BASE MOUNTING

オプションのアンテナベースを使う。
USE OPTIONAL ANTENNA BASE.

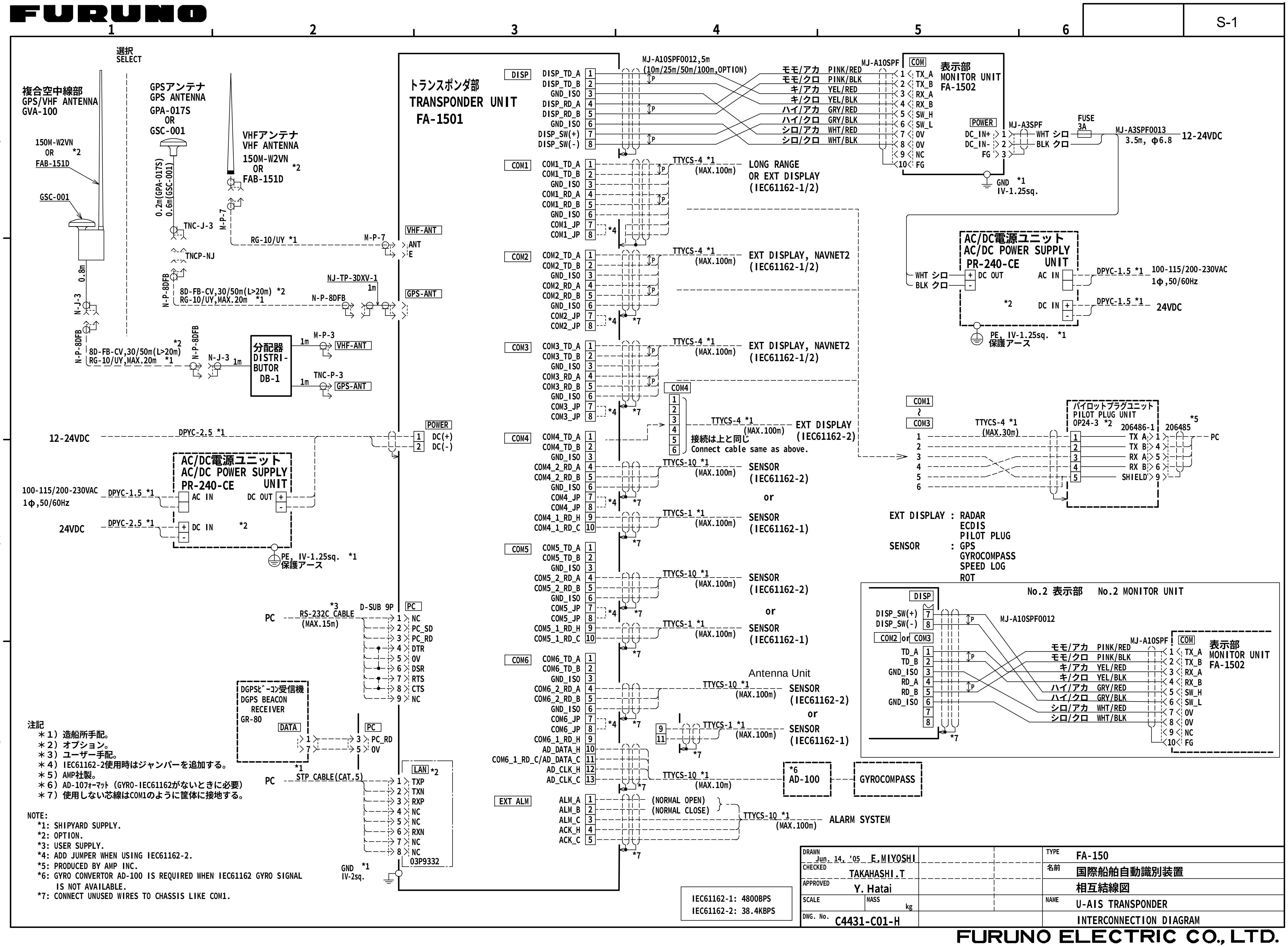
傾斜 INCLINATION	-5° - 33°	32° - 65°	65° - 98°
装備方法 MOUNTING METHOD			
アンテナベース型式 ANT. BASE TYPE コード番号 CODE No.	直型アンテナベース RIGHT ANGLE ANTENNA BASE No.13-QA330 000-803-239	L型アンテナベース L-TYPE ANTENNA BASE No.13-QA310 000-803-240	

アンテナベース基部
MOUNTING DIMENSIONS OF ANTENNA BASE.



DRAWN	Mar. 9 '05　T.YAMASAKI	TITLE	GPA series
CHECKED	Mar. 9 '05　H.HAYASHI	名称	空中線部
APPROVED	Mar.10 '05　H.Hayashi		装備要領図
SCALE	MASS	NAME	ANTENNA UNIT
DWG.No.	C4384-Y01- C		INSTALLATION PROCEDURE

FURUNO ELECTRIC CO., LTD.


FURUNO
S-1
選択
SELECT
複合空中線部
GPS/VHF ANTENNA
GVA-100
150M-W2VN
OR
FAB-151D
GSC-001
GPSアンテナ
GPS ANTENNA
GPA-017S
OR
GSC-001
0.2m(GPA-017S)
0.6m(GSC-001)
TNC-J-3
TNCP-NJ
VHFアンテナ
VHF ANTENNA
150M-W2VN
OR
FAB-151D
M-P-7
RG-10/UY *1
8D-FB-CV,30/50m(L>20m) *2
RG-10/UY,MAX.20m *1
N-P-8DFB
NJ-TP-3DXV-1
N-J-3
分配器
DISTRI-
BUTOR
DB-1
M-P-3
TNC-P-3
VHF-ANT
GPS-ANT
12-24VDC
DPYC-2.5 *1
AC/DC電源ユニット
AC/DC POWER SUPPLY
PR-240-CE UNIT
100-115/200-230VAC
1φ,50/60Hz
DPYC-1.5 *1
AC IN
DC OUT
24VDC
DC IN
PE, IV-1.25sq. *1
保護アース
トランスポンダ部
TRANSPONDER UNIT
FA-1501
DISP
DISP_TD_A
DISP_TD_B
GND_ISO
DISP_RD_A
DISP_RD_B
DISP_SW(+)
DISP_SW(-)
MJ-A10SPF0012,5m
(10m/25m/50m/100m,OPTION)
モモ/アカ PINK/RED
モモ/クロ PINK/BLK
キ/アカ YEL/RED
キ/クロ YEL/BLK
ハイ/アカ GRY/RED
ハイ/クロ GRY/BLK
シロ/アカ WHT/RED
シロ/クロ WHT/BLK
MJ-A10SPF
表示部
MONITOR UNIT
FA-1502
TX_A TX_B RX_A RX_B SW_H SW_L 0V 0V NC FG
POWER
DC_IN+ DC_IN- FG
MJ-A3SPF
FUSE 3A
WHT シロ
BLK クロ
MJ-A3SPF0013
3.5m, φ6.8
12-24VDC
GND *1
IV-1.25sq.
COM1
COM1_TD_A COM1_TD_B GND_ISO COM1_RD_A COM1_RD_B GND_ISO COM1_JP COM1_JP
TTYCS-4 *1
(MAX.100m)
LONG RANGE
OR EXT DISPLAY
(IEC61162-1/2)
COM2
EXT DISPLAY, NAVNET2
(IEC61162-1/2)
COM3
EXT DISPLAY, NAVNET2
(IEC61162-1/2)
COM4
接続は上と同じ
Connect cable same as above.
EXT DISPLAY
(IEC61162-2)
COM4_2_RD_A COM4_2_RD_B COM4_1_RD_H COM4_1_RD_C
TTYCS-1Q *1
SENSOR
(IEC61162-2)
or
TTYCS-1 *1
SENSOR
(IEC61162-1)
COM5
COM6
Antenna Unit
AD_DATA_H
COM6_1_RD_C/AD_DATA_C
AD_CLK_H
AD_CLK_C
TTYCS-1Q *1
(MAX.10m)
*6
AD-100
GYROCOMPASS
EXT ALM
ALM_A ALM_B ALM_C ACK_H ACK_C
(NORMAL OPEN)
(NORMAL CLOSE)
ALARM SYSTEM
PC
RS-232C CABLE *3
(MAX.15m)
D-SUB 9P
NC PC_SD PC_RD DTR 0V DSR RTS CTS NC
DGPSビーコン受信機
DGPS BEACON
RECEIVER
GR-80
DATA
PC_RD 0V
STP CABLE(CAT.5)
LAN *2
TXP TXN RXP NC NC RXN NC NC
03P9332
GND *1
IV-2sq.
AC/DC電源ユニット
AC/DC POWER SUPPLY
PR-240-CE UNIT
DPYC-1.5 *1
100-115/200-230VAC
1φ,50/60Hz
DPYC-1.5 *1
24VDC
PE, IV-1.25sq. *1
保護アース
COM1 ~ COM3
TTYCS-4 *1
(MAX.30m)
パイロットプラグユニット
PILOT PLUG UNIT
OP24-3 *2
206486-1
206485 *5
TX A TX B RX A RX B SHIELD
PC
EXT DISPLAY : RADAR
ECDIS
PILOT PLUG
SENSOR : GPS
GYROCOMPASS
SPEED LOG
ROT
No.2 表示部 No.2 MONITOR UNIT
MJ-A10SPF0012
COM2 or COM3
TD_A TD_B GND_ISO RD_A RD_B GND_ISO
表示部
MONITOR UNIT
FA-1502
注記
＊1) 造船所手配。
＊2) オプション。
＊3) ユーザー手配。
＊4) IEC61162-2使用時はジャンパーを追加する。
＊5) AMP社製。
＊6) AD-10フォーマット (GYRO-IEC61162がないときに必要)
＊7) 使用しない芯線はCOM1のように筐体に接地する。
NOTE:
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: USER SUPPLY.
*4: ADD JUMPER WHEN USING IEC61162-2.
*5: PRODUCED BY AMP INC.
*6: GYRO CONVERTOR AD-100 IS REQUIRED WHEN IEC61162 GYRO SIGNAL
IS NOT AVAILABLE.
*7: CONNECT UNUSED WIRES TO CHASSIS LIKE COM1.
IEC61162-1: 4800BPS
IEC61162-2: 38.4KBPS
DRAWN Jun. 14, '05 E.MIYOSHI
CHECKED TAKAHASHI.T
APPROVED Y. Hatai
SCALE
MASS kg
DWG. No. C4431-C01-H
TYPE FA-150
名前 国際船舶自動識別装置
相互結線図
NAME U-AIS TRANSPONDER
INTERCONNECTION DIAGRAM
FURUNO ELECTRIC CO., LTD.